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Participant Handbook

Sector

Textile Sector Skill Council

Sub-Sector

Technical Textiles

Occupation

Weaving – Technical Textiles

Reference ID: **TSC/Q8401, Version 4.0**

NSQF Level 3



**Circular Loom
Operator
(Shuttle type)**

This book is jointly developed by

Textile Sector Skill Council (TSC) &

Technical Training & Research Centre - Lohia Corp.

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Textile Sector Skill Council (TSC)

Address: Unit 1011-1013, 10th Floor, Ambadeep Building,
14 Kasturba Gandhi Marg, New Delhi - 110 001

Email: info@texskill.in

Web: www.texskill.in

Phone: 011-43536355 - 7

Technical Training & Research Centre - Lohia Corp.

Address: National Highway 91, Malau, Uttar Pradesh - 209203

Email: ttrc@lohiagroup.com

Web: www.lohiatttrc.com

Phone: 0512 304 5100





“ Skilling is building a better India. If we have to move India towards development then Skill Development should be our mission. ”

Shri Narendra Modi
Prime Minister of India



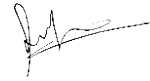
Acknowledgements

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TSC is the Sector Skill Council approved by NSDC & recognized awarding body approved by NCVET under the aegis of MSDE.

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Special Acknowledgement to **Mr. Rajeev Kumar Dwivedi & Mr. Jitendra Kumar Arya**



Dr. Swapna Mishra
CEO
(Textile Sector Skill Council)



About TSC

Textile Sector Skill Council (in short TSC) is a non-profit making organisation having license under Section 8 (1) of the Companies Act, 2013 registered under Companies Act 2013. Textile Sector Skill Council has been approved by National Skill Development Corporation, set up by Ministry of Finance, Govt. of India. TSC will develop a skilled work force for the textile industry through setting curriculum for training and accreditation of trade competency. TSC is to facilitate scalable “skill training” to the complete work force engaged in the manufacture of textile and hand-loom products. National Skill Development Corporation (NSDC approved Textile Sector Skill Council (TSC) for development of skill in spinning, weaving, processing and hand-loom sectors of the textile industry. Setting of Textile Sector Skill council has also been endorsed by Ministry of Textiles, Government of India vide approval letter dated 6th September 2013. The TSC is an organization represented by Industry, government and academia to develop innovative skill solutions and to investment in skills and job creation. The key objective of TSC is to define the skill requirement of the industry and to create a deployable talent pool of workforce for the textile industry. The TSC is incubated by textile industry associations and training providers including textile research associations and office of the Development Commissioner of Hand-looms. A governing council of this group will oversee the running of the TSC with its CEO and a team of professionals, who will collect, compile and manage Labour Market Information System (LMIS), build competency framework, evaluation methods and curriculum development in consultation with industry and academia.

About TTRC

TECHNICAL TRAINING & RESEARCH CENTRE (TTRC) was established by LOHIA CORP LTD at Kanpur, India in 2012 as an independent division of the group with objectives blended with CSR commitment to impart skills to unemployed youth for employment generation as well as to support the growing raffia industries by providing skilled & trained manpower. The objectives of TTRC have been drawn up in line with the vision of Mr Raj Kumar Lohia, Chairman, Lohia Group to create a Training Institution for the Raffia industry in the country.

Since its operation in 2012, TTRC has emerged as the global destination for training requirement in all disciplines of Raffia industry from Operator level program to Executive development programs with a systematic approach to create pool of trained & knowledge based manpower for Raffia Sector. Perhaps, TTRC is the first of its kind Technical training & research centre of international repute dedicated for Woven sack industry. TTRC campus at Kanpur, India is spread across 10 acre land with residential facilities within the campus & state of art infrastructure including Testing Laboratory & Workshop equipped with Tape plant, Looms, BCS, Valvomatic, MFY Extruder, etc.

LOHIA's TTRC has also been engaged by Woven sack manufacturing units from different countries of SAARC, Africa, Middle East, South East Asia, GCC as the Training partner. TTRC's Onsite training modules at factory premises are becoming popular which enable industries to improve productivity & quality in their operation. USP of TTRC programs is customization as per the requirement of Industries. TTRC's skill training program has been shortlisted by NSDA (apex body of Govt of India for skill development) as an innovative initiative in area of skill development. TTRC is registered as a Training Partner with Textile Sector Council Under NSDC to promote skill development.





Certificate

COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

TEXTILE SECTOR SKILL COUNCIL

&

TECHNICAL TRAINING & RESEARCH CENTRE - LOHIA CORP.

for

SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of

Job Role/ Qualification Pack: 'Circular Loom Operator (Shuttle type)' QP No. 'TSC/Q8401 ; NSQF Level 3'

Dr. Swapna Mishra
CEO
(Textile Sector Skill Council)

Date of Issuance: **May 08th, 2025**

Valid up to*: **May 08th, 2028**

**Valid up to the next review date of the Qualification Pack or the
'Valid up to' date mentioned above (whichever is earlier)*

Mr. Rajeev Kumar Dwivedi
Director
(Technical Training & Research Centre - Lohia Corp.)



About this Book

This Participant Handbook is designed to enable training for the specific Qualification Pack (QP). Each National Occupational (NOS) is covered across Unit/s.

Plastics raffia or Woven sack sector is one of the key segments of plastics processing industries in India, contributing to the growth of consumption of commodity plastics like polyethylene (PE) & polypropylene (PP). The Plastics Woven sack industry can be classified into the following major product packaging categories depending upon the end use applications:

- Polyolefin Woven Sacks / bags for packaging of Fertilizer, Cement, Food grain, Sugar, Petrochemical products, poultry / animal feed / agricultural produces, resins & chemicals etc.
- Flexible Intermediate Bulk Containers (FIBC)
- Tarpaulins of different types & applications
- Leno bags for fruit & vegetable packaging
- Wrapping fabrics
- Other tailor - made applications of woven fabrics in Postal, parcel, courier, good transportation/ shipping / logistic areas etc.
- Geotextiles / agro textiles

The **Circular Loom Operator (Shuttle Type) (TSC/Q8401)** is responsible for running the Circular Loom machine under supervision by maintaining health, safety, and security in the raffia industry.

This unit/task covers the following:

1. Taking charge and handing over the shift to Circular Loom Operator (Shuttle type) (TSC/N8401)
2. Running Circular Loom Shuttle type (TSC/N8402)
3. Undertake warp threading in Circular Loom (Shuttle type) (TSC/N8403)
4. Contribute quality weaving in Circular Loom (Shuttle type) (TSC/N8404)
5. Maintain work area, tools and machines in raffia sector (TSC/N9011)
6. Working in a team in raffia sector (TSC/N9012)
7. Maintain health, safety and security at work place in raffia sector (TSC/N9013)
8. Comply with industry and organizational requirements in raffia sector (TSC/N9014)



Symbols Used



Learning Outcomes



Objectives



Notes



Tips



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It is recommended that all trainings include the appropriate Employability Skills Module Content for the same is available here:

<https://www.skillindiadigital.gov.in/content/list>







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REIMAGINE FUTURE



1. Introduction

Unit 1.1 - Introduction and History of weaving

Unit 1.2 - Basic Weaving Principle & Terminology



Key Learning Outcomes

At the end of this module, you will be able to:

1. Know about Weaving Technology.
2. Understand the Basic Principle of Loom.
3. Understand the basic technical terms.
4. Know about the Knotting and Threading process.
5. Know how to operate the Circular Loom.
6. Determine the Fault and Remedies of the weaving operation.
7. Understand the basic maintenance of Loom.
8. Perform calculations related to Weaving.

UNIT 1.1: Introduction and History of weaving

Unit Objectives

At the end of this unit, you will be able to understand and know the:

1. Document the past and make it easier to understand today.

1.1.1: Introduction

Weaving is one of the oldest skills known to humans, dating back to prehistoric times. Clothes have given a distinct identity to almost all ancient civilizations of the world. India especially stands out in this regard. It has a glorious past in the production of textiles and was especially renowned for printed textiles. The use of printing blocks in India goes as far back as 3000 B.C., and some historians are of the view that it may have been the original home of textile printing. 'The export of printed fabrics [from India] to China can be dated to the fourth century B.C., where they were much used and admired, and later, imitated.' the industry in India grew at such a pace that it became the major supplier of textiles to the rest of the world. Evidence of Indian textile trade in ancient times has been recovered from China in the East to Italy in the West. These textiles were very expensive and used to bring enormous wealth to India (as Pliny, historian of ancient Rome, complains in his writings).

Weaving is the process of making fabrics by interlacing the threads lengthwise and width wise commonly known as **warp** and **weft** in a regular order. The operation is performed in a machine known as **LOOM**. Two sets of yarns are interlaced, almost always at right angles to each other. One, called the warp, runs lengthwise in the loom; the other, called the filling, weft, or woof, runs crosswise. The raising and lowering sequence of warp threads in various sequences gives many possible weave structures.

Scan the QR code to see the related video



Technical Textiles: A Sunrise Segment
in the Textile Ecosystem

1.1.2: History

Weaving is a process of formation of fabric with interlacement of two or more sets of yarns using a stable machine called loom. Human beings have started using woven fabrics since the dawn of history.

- Egyptians made woven fabric some 6000 years ago.
- Silk was one of the most important products in China 4000 years ago.
- In the third century the Shading Mechanism was introduced in Europe.
- In 12th Century Invention of first Wooden Hand Loom in England.
- In 1733 Shuttle Invented by John Key but that is hand operated.
- In 1785 the Invention of Power Loom.
- In the early 1800 Power Loom operated by Steam Power.
- In 1895 Loom operated by Electric Engine.

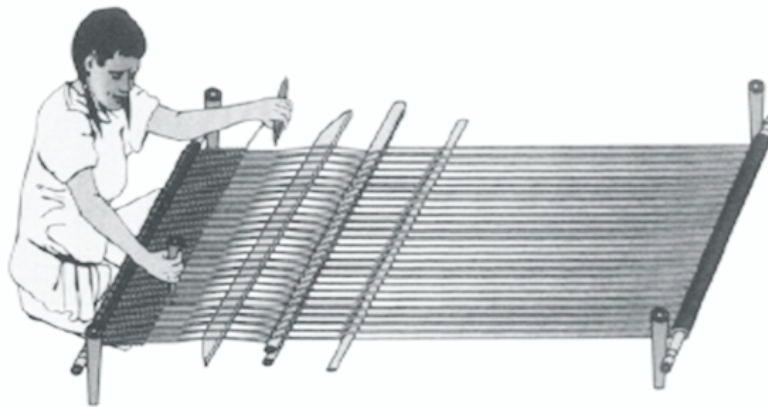


Fig: Hand operated weaving process

- At the beginning of 1930, Each Weaving machine driven or operated by individually electric motor.
- This Loom drive concept has remained in use until the present
- Continuous weft insertion on circular Loom was proposed before the end of the 19th century.
- After mid. 90 Multiphase Circular Weaving Machine invented.

In India too, there existed some of the finest hand - woven fabrics. There are some references in Tamil literature, that the great poet, Thiruvalluvar was a hand loom weaver.

UNIT 1.2: Basic Weaving Principle & Terminology

Unit Objectives

At the end of this unit, you will be able to understand and know the:

1. Explain principle of weaving machine
2. Know and define terms used in weaving.

1.2.1: Basic Weaving Principle

Weaving consists of making textiles from yarn. The yarn can be made, such as wool, cotton, silk, Polymers glass fiber. In the weaving process the threads are stretched parallel on the weaving machine. These stretched threads are known as warp threads. Other threads, known historically as the woof or weft but now referred to as the filling, are inserted one by one through a gap (the shed) in the warp threads, at right angles to them. As each filling thread is inserted it is pressed up against the previous ones, in a process known as beating up.

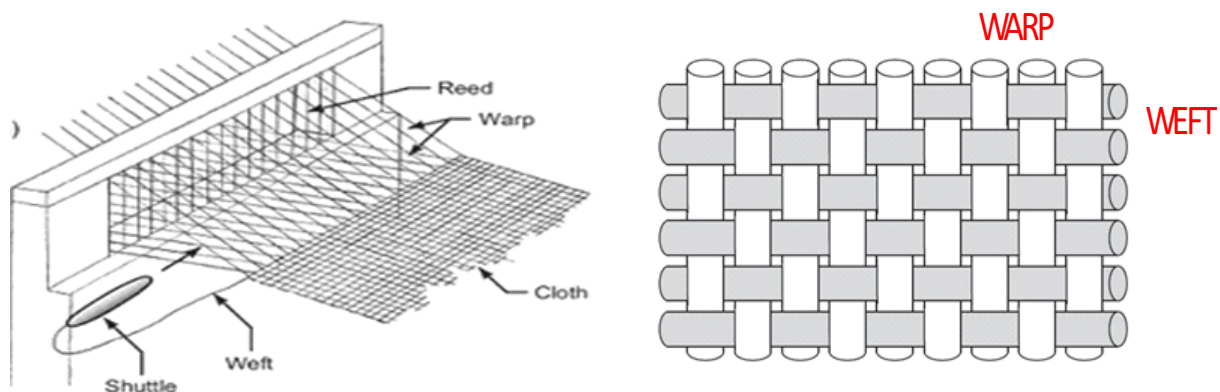


Fig.1.2.1.1: General textile process flow sequence

This basic principle has remained unchanged throughout the centuries. A textile is formed by weaving the filling threads one by one between the warp threads. In the loom the warp threads are led through eyes in metal rods known as heddles, one for each thread. Alternate heddles are joined together in a frame. There are at least two frames, together making up the harness. The purpose of the harness is to move the warp threads up and down. By moving one frame up and the other down, an opening (the shed) is formed in the warp threads, through which the filling thread is inserted. The frames are then moved in opposite directions, binding the filling thread into the warp. Each time a filling thread is inserted, it is pressed against the previous ones by a reed.

1.2.2: Terminology related to Weaving

- **Warp:** Tape running the length of the loom across which tapes are woven.
- **Weft:** Tape which is woven crosswise to the warp to form the web.
- **Fabric mesh/density:** Measured as the number of tapes per square inch in both the warp and weft direction of woven fabric. Example 10x10
- **Ends per dm:** Numbers of warp tape in per 10cm of fabric.
- **Pick per dm:** Number of weft tape per 10cm of fabric.
- **Threading:** Mounting of warp tape from creel to weaving ring.
- **Bobbin:** A spool or cylindrical barrel onto which tape is wound for use in production.
- **DFL:** Double flat lay (Tubular shape of fabric)
- **SFL:** Single flat lay (Single layer of fabric)
- **DENIER:** The grammage of 9000 mt length of tape is known as denier.
- **GSM (gram per square meter):** The weight of one-meter length by one-meter width of SFL (Single Flat Lay) of fabric in gram is called GSM.
- **GPM (gram per meter):** The weight of one-meter length of DFL (Double flat Lay) of fabric in gram is called GPM.
- **TENACITY:** The ultimate (breaking) force of the Tape/Yarn (in gram-force units) divided by the denier.

Notes 



2. Taking Charge & Handing over the shift to Circular loom operator (Shuttle type)



Unit 2.1 - Taking Charge & Handing over the shift to Circular loom operator (Shuttle type)



Key Learning Outcomes

At the end of this module, you will be able to :

1. Perform taking charge and handing over of shift.
2. Discuss the production related details/ issues to the incoming counter part.
3. Explain the general checklist required for running the circular loom.

UNIT 2.1: Taking Charge and Handing Over the Shift

Unit Objectives

At the end of this unit, you will be able to:

1. understand importance of taking and hand over of shift charge.
2. discuss the production related details/ issues to the incoming counter part.
3. explain the general checklist required for running the circular loom.

2.1.1: Taking of Shift Charge

Taking shift charge is the process of understanding the work completed and pending for the day / shift. This is important communication and any gap in this will lead to loss, delay and damage. To be competent operator must be able to,

	<p>Come at least 10-15 minutes earlier to the workplace. The main advantage of joining shift earlier by 10-15 minutes is you and your counterpart will have enough time to discuss and understand the aspect so far scheduled activities.</p>
	<p>Meet the previous shift operator and discuss with him/ her regarding the issues faced by them with respect to the quality or production or spare or safety or any other specific instruction etc. This is important because, as an operator you should know what has happened in previous shift and what actions are to be taken in next shift.</p>
	<p>Take complete round of respective weaver line in order to get the overall picture of the actual working of that particular weaver line. Check the cloth for the running damages.</p>
	<p>Ensure that necessary operational tools like drawing hook, cutter are on place. Unavailability of such tolls will create interruption in the production due to machine stoppages.</p>

LOOM CARD				LOOM NO.:	
CUSTOMER :	SORT NO.:	DESIGN NO.:	DESCRIPTION		
DELIVERY DATE	WEAVING		WEFT FACTORY		
WARPING NO.	WARP	WEFT			
LOOM NO.	LOOM	LOOM			
TOTAL SPINDS	DATE	SHIFT	WELT	DESIGN	COLOURWAY
PIED SPACE					
BEAM NAME & NO.					
BEAM NO. & M.C. NO.					
BEAM NO.					
LENGTH IN METER					
IDENTIFY OTHERS					
PREPARED BY					
WEAVE					
KNOTTING					
BEAM STARTED DATE					
BEAM STARTED BY					
BEAM STOPPED BY					
DATE					

The information in the sort card (loom card) is required to ensure that required fabric particulars are being maintained during the weaving process.



Check availability of the weft yarn packages as per type of fabric running and yarn type mentioned in the loom card

Check for the availability of the weft & the condition of the same



Check the condition of the running creels, for cross ends, ends pulling out particularly at the crease or side fold



Check for the size of the cloth rolls & to see whether any indication is there in the cloth rolls



Check the cleanliness of the machines & other work areas.



Check whether any spare/raw material/ tool / fabric/ any other material is thrown under the machines or in the other work areas.

	<p>Question the previous shift weaver for any deviation in the above and should bring the same to the knowledge of his/ her shift superior as well that of the previous shift</p>
	<p>Ensure that necessary safety aids / tools like mask, hearing bud, etc. should be on place in order to maintain safety during the working and good health.</p>
	<p>Ensure the wastes collection boxes are empty while taking charge of shift</p>

Table.2.1.1.1: Taking of shift charge

2.1.2: Handover of Shift Charge

Handover shift charge is the process to make upcoming operator understand about the work completed and pending for the day / shift. This is also very important communication and any gap in this will lead to loss, delay and damage. To be competent operator must be able to,

	<p>Hand over the shift to the incoming operator in a proper manner. Proper manner means, you must ensure that incoming operator has understood the activities to be perform by him.</p>
	<p>Meet the succeeding shift operator and discuss with him/ her regarding the issues faced by you with respect to the quality or production or spare or safety or any other specific instruction etc.</p>



To provide all relevant information regarding the stoppages or break down in the machine, any damage to the fabric or machine. If this is not communicated properly then the breakdown and damages may reoccur.

LOOM CARD				LOOM NO.:	
CUSTOMER :	SORT NO.	DESIGN NO.:	DESCRIPTION	WEFT FACTORY	
DELIVERY DATE					
WARRANTY NO.					
WARRANTY NO.	WARP	WEFT			
	LENGTH	WEIGHT			
TOTAL FEED		DATE	SHIFT	TYPE	DESIGN
WEFT MACHINE					COLOURWAY
WEFT MACHINE NO.					
WEFT MACHINE NO. & M.O. NO.					
WEFT MACHINE NO.					
LENGTH IN METER					
IDENTIFY OTHER					
REMARKS TO OTHER					
WEAVE					
WEFT PRODUCTION					
WEFT STARTED DATE					
WEFT STARTED BY					
WEFT STOPPED BY					
PAGE NO.					

Ensure the technical details are mentioned on the Sort card / loom card for fabric being produced before handover of the shift



Keep /arrange the material/tools at their respective position.



Maintain the cleanliness of the machines & other work areas before handover the shift.



Get clearance from the incoming counterpart before leaving the work spot report to his/ her shift superiors as well as that of the incoming shift operator in case his/ her counterpart doesn't report for the incoming shift.



Ensure the shift has to be properly handed over to the incoming shift operator

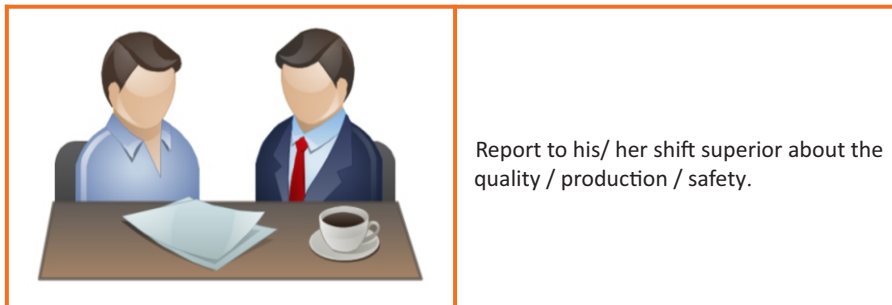


Table.2.1.2.1: Handing over shift charge

To avoid wastage of time and material and to prevent accidents: Carry out the following in order to avoid wastage and material in the department and also to prevent any accidents

- Meet the previous shift weaver & discuss with him/ her the issues faced by them with respect to the quality, production, spare, safety or any other specific instruction
- Understand the type of fabric produced, specifications of fabrics followed in the circular loom for his allocated number of looms or machines
- Ensure the technical details are mentioned on the display board on circular loom machine
- Understand the machine position either it is in working condition or waiting for want of program or stop due to any other technical reasons.
- Information regarding the new fabric qualities/sorts started in the previous shift, their performance, rejection or defects occurred in the same shift and any other instruction to be followed / received from supervisors/shift in-charge. Also ensure that target production was achieved in previous shift
- Look at Stoppages and breakdown history of machine in previous shift.
- Understand next shift fabric sorts to be knotted or gaited and also understand the urgency if any.
- Special care to be taken for critical qualities in program and if any sampling activity.
- Ensure that Empty roll / trolley is kept available for fabric roll unloading.
- Check that machine and machine surrounding area is kept clean.
- Check loom, passage area and all other parts are clean
- Ensure that all the utilities supply is proper and sufficient.
- Report to your superior about the quality / production / safety issues/ any other issue faced in the shift before leaving the department.
- Report to your supervisor in case your counterpart doesn't report for the incoming shift

Scan the QR code to see the related video



Loom Operator Duty

3. Important communication

Briefly explain the important information to be communicated during shift changing

Notes 





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RE > IMAGINE FUTURE

3. Running Circular Loom Shuttle type



Unit 3.1 - Layout of Circular Loom

Unit 3.2 - Parts & Function of Circular Loom

Unit 3.3 - Instructions for Circular Loom Operator (Shuttle Type)

Unit 3.4 - Operating Procedure of Circular Loom



TSC/N8402

Key Learning Outcomes

At the end of this module, you will be able to:

1. Layout of Circular Loom
2. Details of different parts of Loom
3. Functions of Loom
4. Instructions for Loom Operator
5. Operating Procedure of Loom

UNIT 3.1: Layout of Circular Loom

Unit Objectives

At the end of this unit, you will be able to:

1. Layout of Circular Loom

3.1.1: Layout

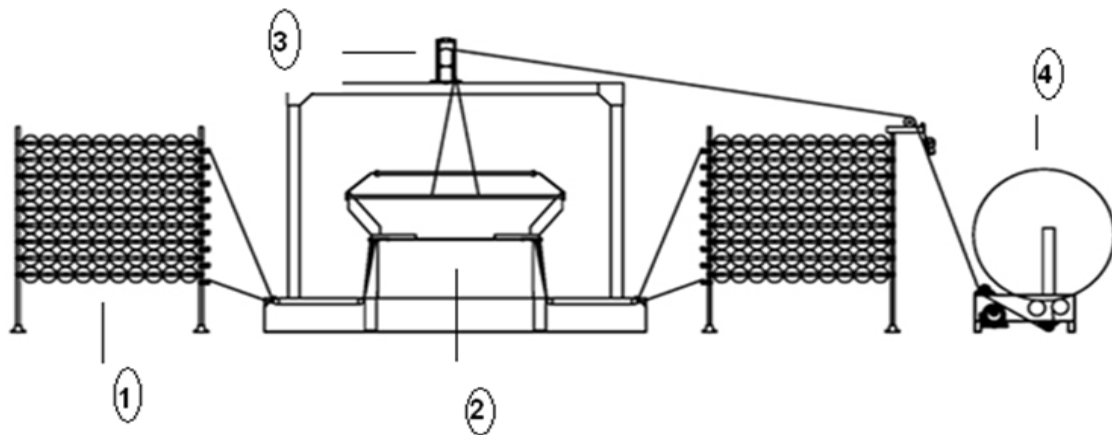
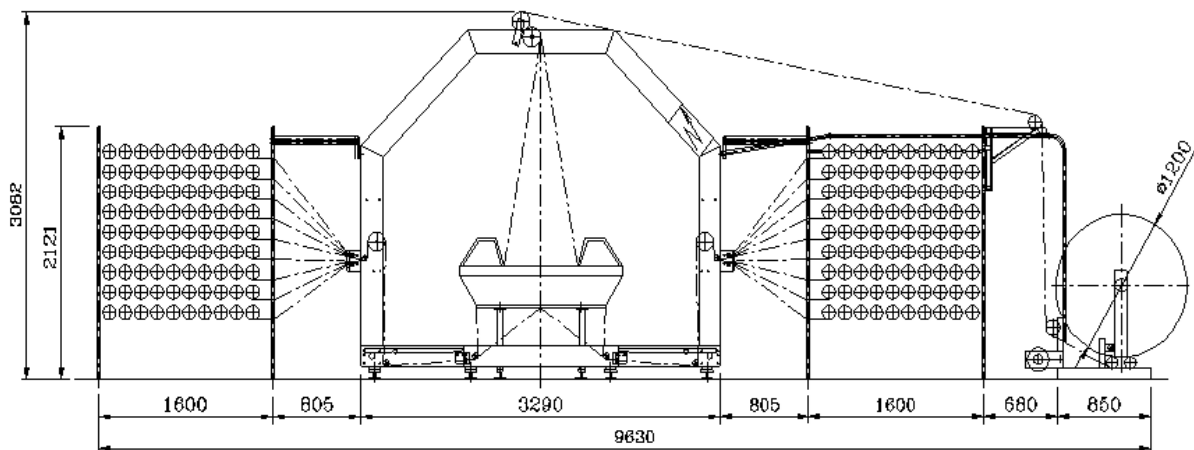


Fig. 1) CREEL STAND UNIT, 2) MAIN FRAME UNIT (WEAVING RING, REED RING) TAKE OFF UNIT, 4) FABRIC WINDER UNI





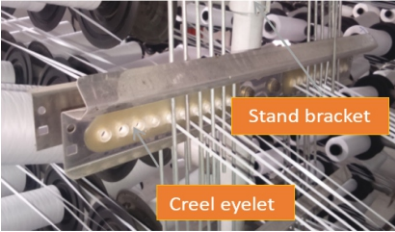


UNIT 3.2: Parts & Function of Circular Loom



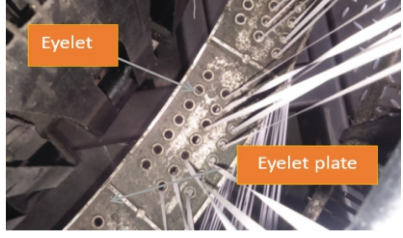



Unit Objectives

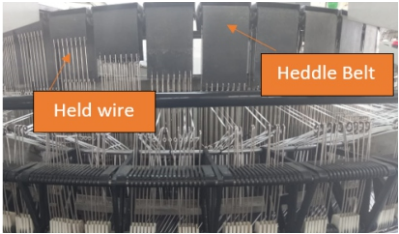
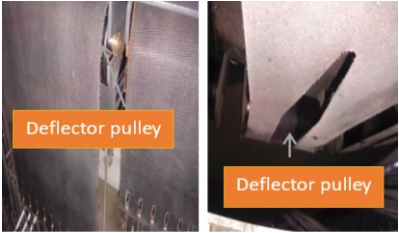
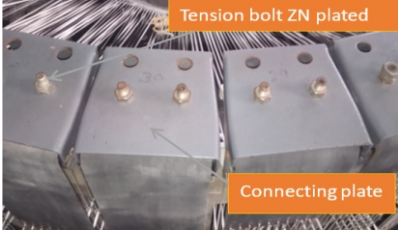


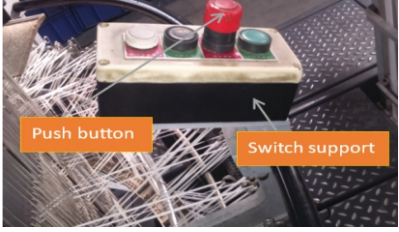
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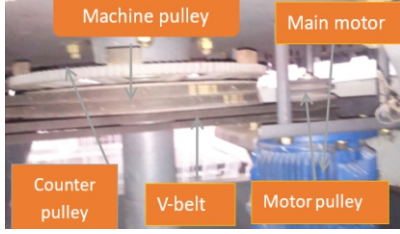
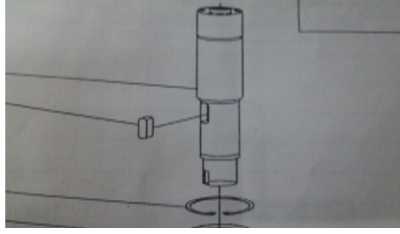



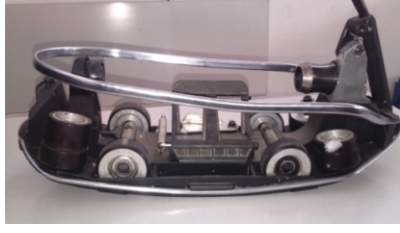
1. Parts & Function of Circular Loom

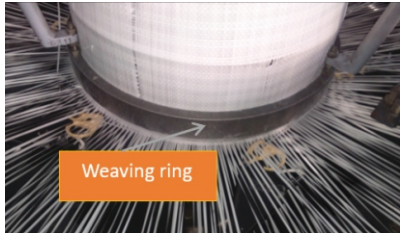
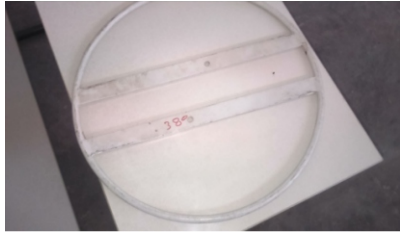

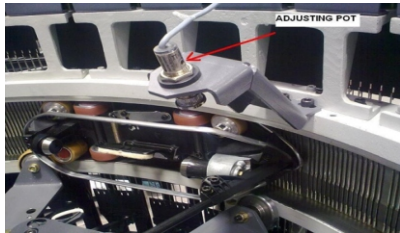


3.2.1: Parts & Function of Circular Loom

1.	<p>Creel disc & adaptor: Creel is a steel pipe construction with creel stands, and bobbin adapters, used at either side of the machine to hold warp bobbins.</p>	 <p>Creel disc</p> <p>Creel adaptor</p>
2.	<p>Drop wire/Tension rod: It indicates warp breakage from creel and give signal to stop weaving machine.</p>	
3.	<p>Creel eyelet: It is a ceramic material used for passing the warp tapes smoothly from creel stand bracket one by one.</p>	 <p>Stand bracket</p> <p>Creel eyelet</p>
4.	<p>Intake comb: It is used to prevent crossing of tapes.</p>	 <p>Intake Comb</p>
5.	<p>Maxi Drag Roller/Inlet Roller: It is used to ensure a smooth inlet for the tapes feed into the machine as well as to maintain uniform warp tension.</p>	 <p>Maxi drag roller</p>

6.	<p>Water Tray & Sponge Roller: It is used to cool down Maxi Drag Roller which starts heating up due to friction created by warp tapes.</p>	
7.	<p>Guide Roller: It is used to guide the warp tape and maintain its tension.</p>	
8.	<p>Eyelet bow & Eyelet Plate: The warp tapes enter in a systematic order through the eyelet bow and then pass through the compensator.</p>	
9.	<p>Compensator: Smoothly feeding of individual warp tape inside the heddle belt. It stops the machine when warp tapes get loose or break.</p>	
10.	<p>Reed ring: It's provided track for shuttle movement. Please ensure only one tape should be threaded into one reed space.</p>	
11.	<p>Spacer: It is used between the compensator to maintain distance between them.</p> <p>Spring: It is attached to the lower end of compensator and provides tension.</p>	

12.	<p>Heddle belt & held wire: It opens shed for weft yarn to come through and complete the weaving process.</p>	
13.	<p>Deflector Pulley: It is used for to & fro movement of the heddle belt along the warp direction.</p>	
14.	<p>Tension bolt ZN plated: It is used to tighten the heddle belt.</p>	
15.	<p>Heat shrinkable tube: It absorbs the heat released by the wire during running of machine.</p>	
16.	<p>Lubrication System: Due to continuous movement of shuttles at high speed, friction is generated which can cause tape breakage. To reduce friction, Lubrication oil system is used.</p>	
17.	<p>Six Manual Control Units: Consisting of Inch button, Stop button (with lock-down) and Start button. The control units are easily accessible to the operating personnel from every point around the Circular Loom.</p>	

18.	<p>Main motor: It is used to run the CAM. Pulley: Reduced the main motor speed. V-belt: Connects the counter pulley & motor pulley.</p>	
19.	<p>Main shaft: It is attached to the counter pulley.</p>	
20.	<p>Adaptor: It is used to connect counter pulley & CAM. Bearings are fitted inside the adaptor.</p>	
21.	<p>CAM: Heart of the Circular loom used for weaving mechanism.</p>	
22.	<p>Jockey lever & swing lever: Used for to and fro of Heddle belt along the warp direction.</p>	
23.	<p>Shuttle assembly: The Shuttles running on rollers are lying loose in the reed ring. They carry the weft bobbins and a part of the weft stop motion.</p>	

24.	Weaving ring: It provides the shape to the fabric as a Double Flat Layer (DFL).	
25.	Round holder: It prevents crease formation in the fabric up to its delivery to the take up roller.	
26.	Magnetic sensor: Whenever weft tape breaks, magnetic disc returns and sensor senses that and stops the machine, it helps in wastage reduction.	
27.	Color sensor: Whenever weft packet or bobbin is about to be exhausted or get empty then sensor senses its black color and stops the machine immediately. It stops the machine just before finishing the weft tapes and prevents the fabric wastage.	
28.	Cloth spreader: It is used to guide the fabric between take up roller weaving ring. It also prevents crease formation in the fabric up to its delivery to the take up roller.	
29.	Take up roller & pressure roller: It is driven by take up gear box fitted in the base frame and the device is attached to take up rollers by chain sprocket system	

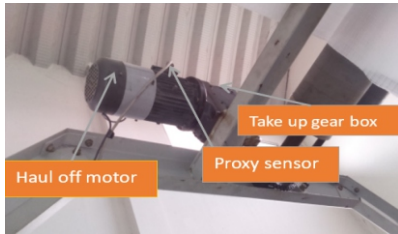


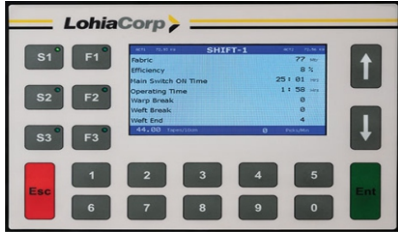
<p>30.</p>	<p>Haul off motor, take up gear box & proxy sensor: In loom, take up roller is driven by haul off gear box fitted with motor which is synchronized and controlled by CWM controller. The CWM Controller receives signal from the main shaft through sprocket/Gear wheel and a proxy sensor. Take up roller is driven by take up gear box.</p>	
<p>31.</p>	<p>Gusseting device: It is used in the machine to make gusset (inside fold) on both side tubular fabric. The gusset helps in providing a box type construction to the bag.</p>	
<p>32.</p>	<p>Slitting device: Thermal slitting device with adjustable temperature control designed for longitudinal cutting of the polyolefin Fabric and simultaneously sealing the edge.</p>	
<p>33.</p>	<p>Winder: It is designed for winding up the tubular/flat cloth on cores, which is made of PVC, Paper, or Steel. The winding tension can be controlled with infinitely variable torque adjustment device.</p>	
<p>34.</p>	<p>Circular Weaving Machine: The CWM controller is used to set and control the working parameters of the circular loom machine.</p>	

Table - 3.2.1.1: Parts & Function of Circular Loom

UNIT 3.3: Instructions for Circular Loom Operator (Shuttle Type)

Unit Objectives

At the end of this unit, you will be able to:

1. Determine the Do's and Don'ts for a Circular Loom Operator (Shuttle Type).

3.3.1: Instructions for Circular Loom Operator (Shuttle Type)

1. Change all shuttle packages at one time. Loading a single package, as it runs- out, is time wasting.
2. Prepare in advance packages of as much near the same size as possible.
3. Rewind, approx. 1-meter pates around the middle of package to present tape, slipping of the package.
4. If by chance, 2 looms go down together which is sometimes unavoidable, then place one set of medium or small packages in one loom and one set of large packages in another loom. This ensures that the looms go down at different times for the next change.
5. Creels to make sure no end sure falling off the bobbins. This could cause breaks and machine stoppage.
6. When a tape breaks in a loom, after mending and before starting look inside the reed to check that no pieces of tapes are wrapped around reed roller.
7. Watch compensator always, if one in particulars moves backward and forward quickly. This means tape is crossed inside heddle and will eventually break.
8. Make sure that all water troughs are filled with wetting agent or water solution.

• DO's :-

1. As a package operation and to avoid slippage of tape during starting of *machine*, rewind approx. 1 to 2 meters of tape in the middle of package.
2. Keep weft package of approx. equal diameter ready, in advance, before machine stops due to weft breakage/exhaustion.
3. Weft packages should always be loaded in sequence by the operators to avoid the stoppage of more than one machine at the same time.
4. Change the entire weft package at same time as quickly as possible.
5. Always press one 'stop' push button at the time of mending warp end or changing weft packages.
6. Have scissors to cut the extra length of warp/weft tape after mending.

7. Remove visible wound tapes from machine's moving parts.
8. Clean photocell lens and reflector mirror at regular intervals to avoid dust/powder formation.
9. Consult supervisor if warp/weft tape breakage frequently.

• **DON'Ts** :-

1. Don't leave broken tape on the machine platform or floor.
2. Don't do cross threading.
3. Don't inch the machine during starting of machine i.e., after changing weft package or after mending 1 or 2 warp ends, machine should be started the help of 'start' push button directly.
4. Don't waste time in putting empty bobbin on bobbin or self-bag. Keep them in apron to reduce time of machine.
5. Don't allow the machine to remain idle without any proper reason.
6. Don't waste time in preparing weft package when machine is stopped.
7. Don't pull warp tape downward and weft tape in the opposite direction of shuttle movement, after mending a warp/weft tape or changing the package.
8. Don't place scissors, hook spanners or any other object on top of the heddle. They may fall into the loom and cause serious damage.

Scan the QR code to see the related video



Circular Loom - Nova 6HS

UNIT 3.4: Operating Procedure of Circular Loom

Unit Objectives

At the end of this unit, you will be able to:

1. Understand how to operate the circular weaving machine.

3.4.1: Operating Procedure of Circular Loom

1. Clean and check the machine for any parts in the central portion.
2. Rotate the machine by hand for about 2-3 rounds to ensure that the cam is moving freely.
3. Set the frequency (25 Hz) in main motor invertors for slow running in beginning.
4. Inch the machine for the while and check the direction of cam. Clockwise direction is recommended.
5. Check the abnormal noise and vibration.
6. Check the direction of rotation of cam, Take up roller and fabric winder.
7. Ensure correct parameter is fed in Circular weaving machine (CWM) controller.
8. Run the machine at a slow speed for some time.
9. Check the functioning of Warp/Weft detection system and magnetic sensor.
10. Ensure proper weaving ring id as per formula given below.
11. $ID = \text{Fabric DFL in mm} \times 2 / 3.14$
12. Check the water in the water tray for Sponge Roller.
13. Check Shuttle assembly parts for free & smooth movement.
14. Start the machine and run continuously.

Notes 





4. Undertake warp threading in circular loom (Shuttle type)



Unit 4.1 - Threading Methodology of Loom



TSC/N8403

Key Learning Outcomes

At the end of this module, you will be able to:

1. Understand Threading Methodology of Loom

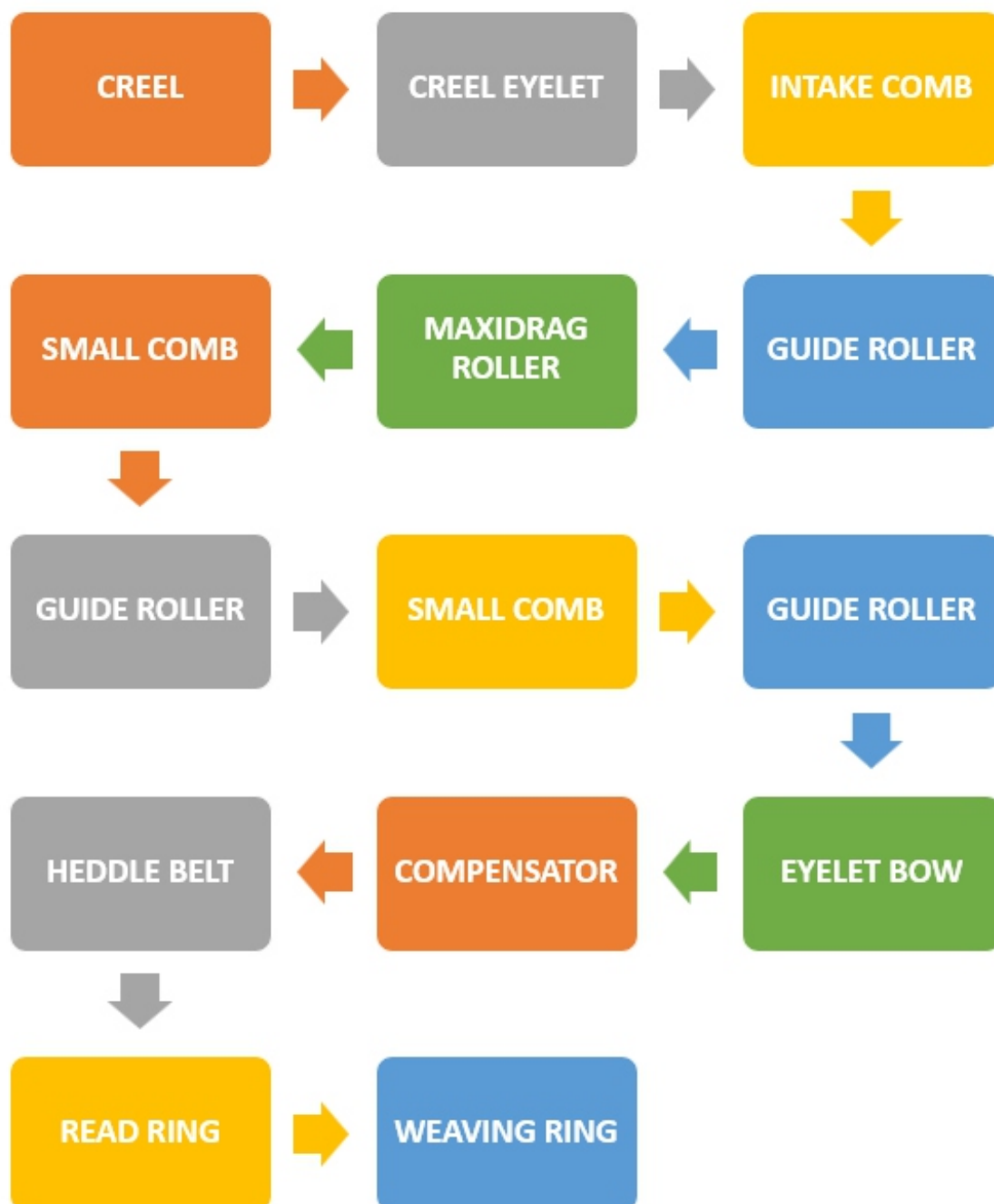
UNIT 4.1: Threading Methodology of Loom

Unit Objectives

At the end of this unit, you will be able to:

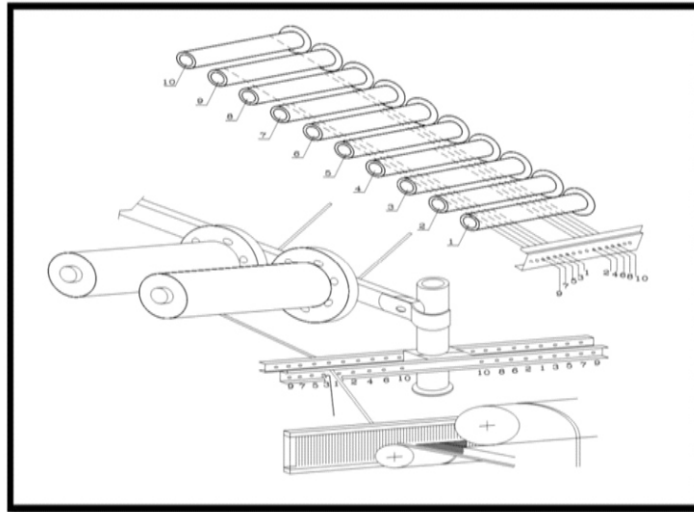
1. Understand Threading Methodology of Loom

4.1.1: Threading Methodology in Loom

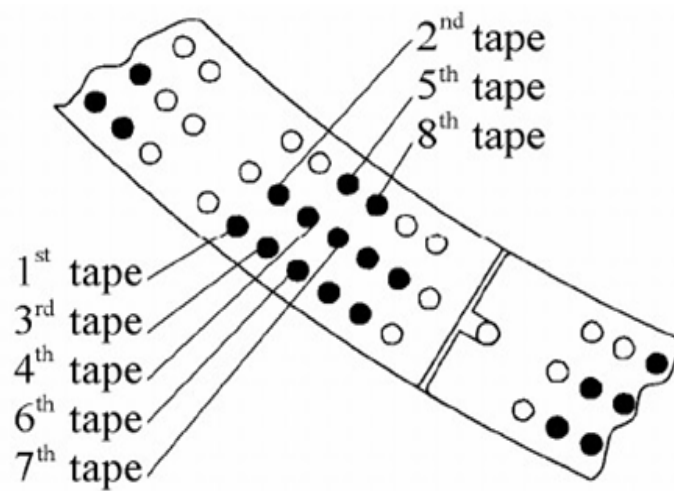


Points to remember during Threading:

- Mounting of tape from creel side to weaving area in proper way.
- Tape should not cross each other.
- “J” hook can be used during threading process.
- Always mount warp tape in a group (called groove).
- No. of warp bobbin decides the groove & pattern of threading.

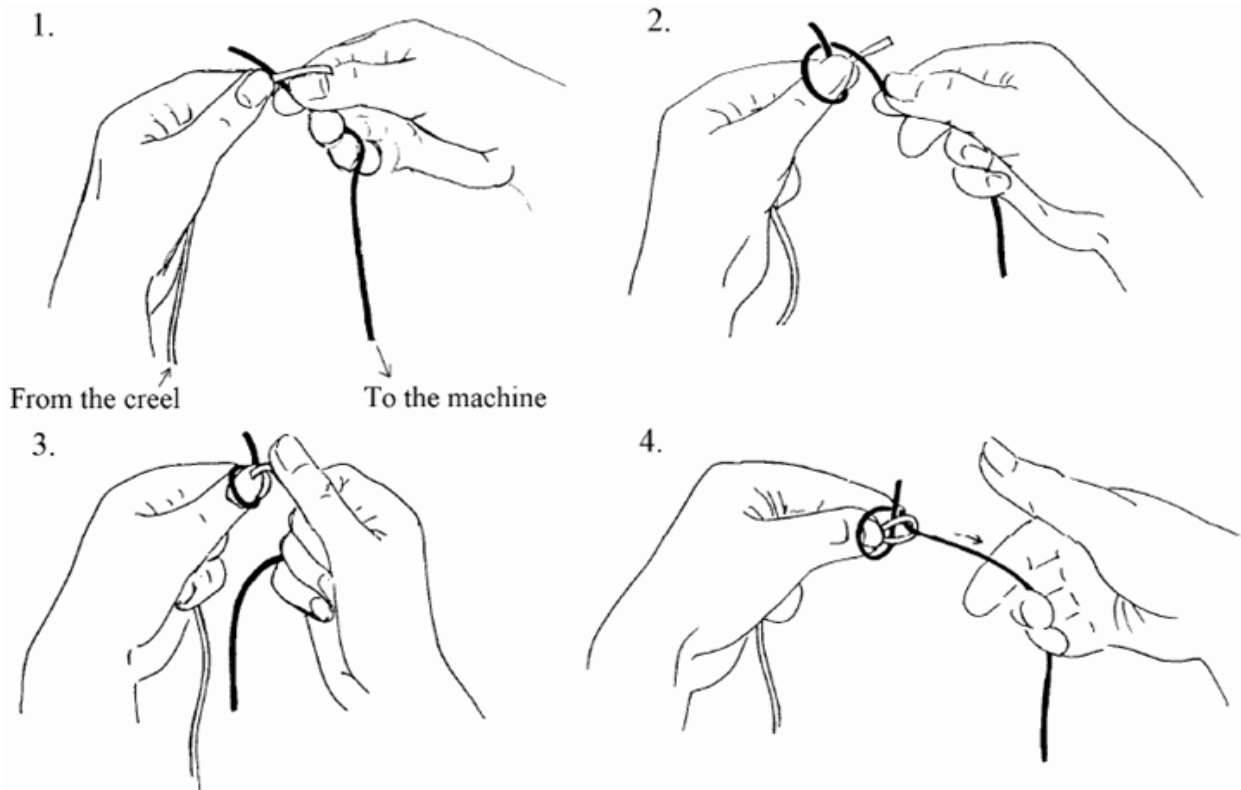


Threading Through Creel Eyelets & Intake Combs



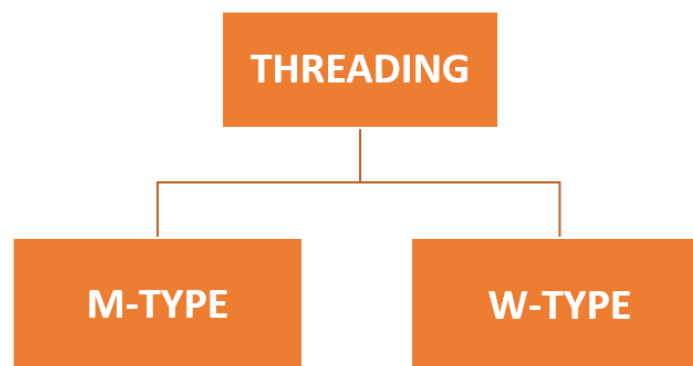
4.1.2: Knotting & Threading Pattern of Tape

- **KNOTTING OF TAPE**



4.1.3: Advantages

- Knot invisible in the fabric.
- Reduction of Tape wastage.
- Easily passes through eyelet of Loom.
- The chance of reopening the knot is very low.
- Reduction of Hole in fabric during weaving.
- Fabric surface would be smooth.

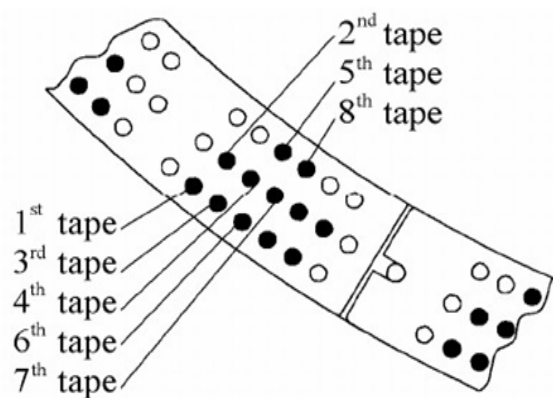
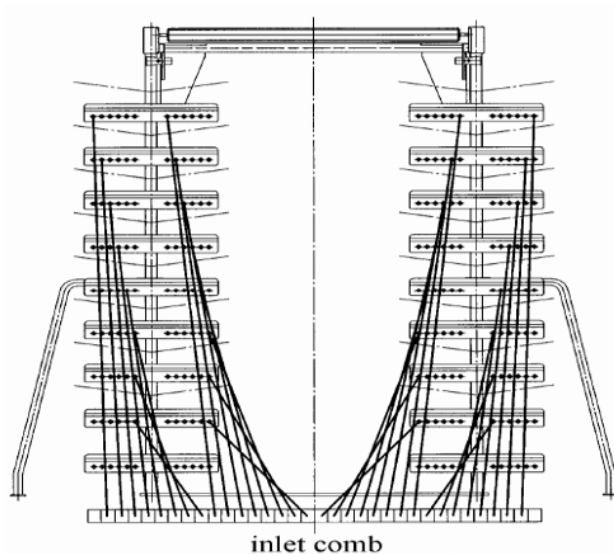
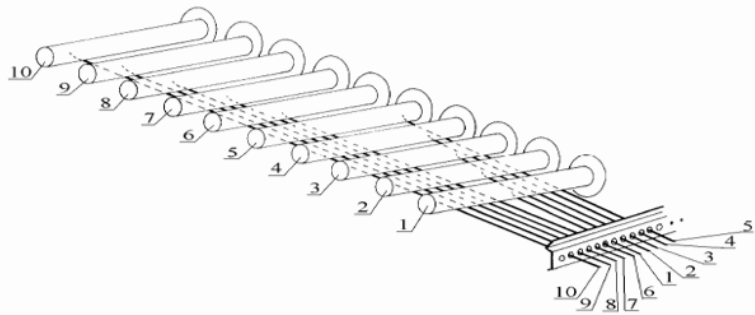


M - TYPE THREADING**“To be demonstrated practically on machines/Loom”****Advantage:**

- Generally used for Low & Medium denier Tape (ex. 400-900 denier)
- Proper tension in warp Tape.
- Less breakage of Tape.
- Can run machine at higher PPM

W - TYPE THREADING**“To be demonstrated practically on machines/Loom”****Advantage:**

- Generally used for higher denier Tape (ex. More than 800 denier)
- More tension in warp Tape.
- Less breakage of Tape.
- Useful for producing FIBC fabric.





5. Contribute quality weaving in Circular loom (Shuttle type)



Unit 5.1 - Process Control Log sheet of Circular Loom

Unit 5.2 - Weaving Faults, Causes & Remedies

Unit 5.3 - General Maintenance of Loom

Unit 5.4 - Weaving Designs

Unit 5.5 - Formulas related to Circular Loom

Unit 5.6 - Formulative Assessment



Key Learning Outcomes

At the end of this module, you will be able to:

1. Fill out the process control log sheet with the required parameters.
2. Know about troubleshooting of the circular loom.
3. Understand the basic maintenance of loom
4. Know various weaving design patterns.
5. Determine the formula related to circular Loom.
6. Solve question related to Weaving.

UNIT 5.1: Process Control Log sheet of Circular Loom

Unit Objectives

At the end of this unit, you will be able to:

1. Fill out the process control log sheet with the required parameters.

5.1.1: Process Control Log sheet of Circular Loom

DATE:	
OPERATOR NAME-	
MACHINE NO. & MODEL NO.	
WEAVING RING ID.(MM)	
FABRIC MESH	
TOTAL NO OF WARP TAPE	
WARP TAPE DENIER & WIDTH	
WEFT TAPE DENIER & WIDTH	
ROLL CUT READING	

Time	PPM	Prod. (mtr)	Warp break	Weft break	Weft end	Fabric size (mm)	GSM

UNIT 5.2: Weaving Faults, Causes & Remedies

Unit Objectives

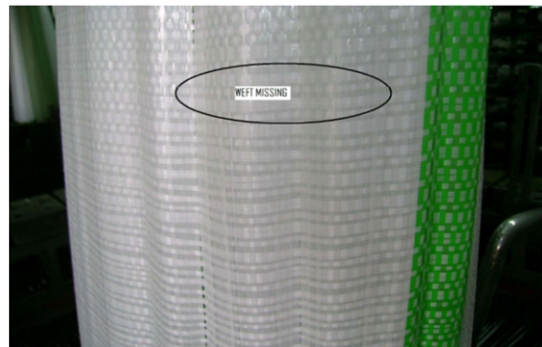
At the end of this unit, you will be able to:

1. Know about troubleshooting of the circular loom.

5.2.1: Weaving Faults, Causes & Remedies

1. MISSING WEFT :-

- Usually this is due to malfunctioning of Magnetic Sensor.
- Verify the problem by exchanging the Sensor for another machine.
- A common cause of this fault is shifting of boom magnet assembly from the location.
- Magnet on reversing should fall under the Magnetic Sensor.



2. UNDER WIDTH FABRIC :-

- Either the wrong weaving ring is being used or weft tension is too high.
- It could be due to higher winding tension of Cheese winders.

3. OVER WIDTH FABRIC :-

- Either the wrong weaving ring is being used or weft tension is too low.
- Insertion finger setting may be incorrect.

4. HOLES IN FABRIC :-

- Warp tape got fibrillated during the running of machine, causing holes in fabric.
- Loosening of warp tapes due to slippage of bobbin.
- Sharp edges / cut or protruding parts on Shuttles.



5. OVERTIGHT FABRIC :-

- Excess weft tension.
- Bobbin winding is tight.
- Shuttle parts are not moving freely.
- Guide Rollers are not moving freely / interrupted movement.

6. WARP TAPE FOLDING :-

- Warp density is higher than required.
- Uneven mending of warp tapes.
- Excess warp tension.
- The warp is not moving freely.

7. FABRIC TEXTURE IS NOT GOOD :-

- High weft Tension.
- Denier variation in warp within the weft Bobbins

8. WEFT TAPE LOOSENING :-

- Improper weft tape mending i.e., path is not correct.
- Leather pads are not used.

9. WEFT TAPE FOLDING :-

- Weft density is higher than required.
- Uneven weft brake tension.
- Excess warp tension.
- Improper maintenance of shuttle assembly.
- Creel Disc is moving tight.
- Warp density is more.

10. WIDTH VARIATION IN LOOM :-

- Uneven gap between the weaving ring and insertion fingers.
- Uneven weft tension for weft bobbins.
- Higher weft bobbins winding tension at cheese winder.
- Higher warp tape tension.
- Restricted movement of guide rollers and inlet rollers.
- Restricted movement of shuttle assembly parts

11. WEFT TAPE SNAPPING :-

- Bobbin Holders is not moving freely.
- Weft Tension is less.
- Acceleration time fed in MMI is less (it should be Approx. 6-7 Sec).
- Time fed in MMI (it should be approx. 4-5 Sec).
- Leather pad / felt is not present at Tension pad.
- The eyes of Insertion Finger are worn out or damaged.
- Weft Bobbin having side slippage of tape.
- Weft Bobbin (cheese tube) is loose inside Flange and rubbing with foam washer.

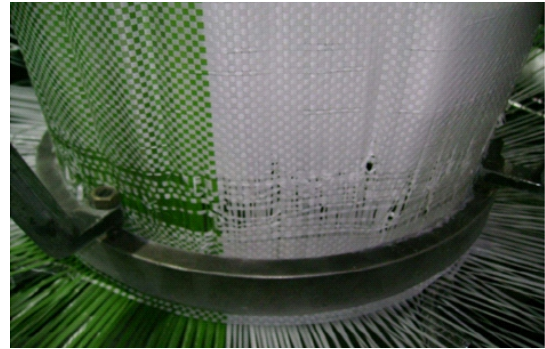


Fig. Weft tape snapping

Scan the QR code to see the related video



Circular Loom Maintenance

UNIT 5.3: General Maintenance of Loom

Unit Objectives

At the end of this unit, you will be able to:

1. Understand the basic maintenance of loom

5.3.1: Preventive Maintenance for Circular Loom

The preventive maintenance for a circular loom is done by shift mechanic and a helper.

Daily preventive maintenance :-

- Clean the machine & floor area.
- Check the bobbin creel.
- Check the drop wire system
- Check the drop oiler for warp tape lubrication, if provided.
- Check the drop oiler for weft tape lubrication, if provided.
- Clean the lens of the colour sensor at every weft bobbin change to obtain best results.

Weekly preventive maintenance :-

Suck of the weaving dust with a vacuum cleaner or blow off dust with compressed air or by hand from:

- | | | |
|------------------|----------------|-----------------------|
| a) The read ring | b) The shuttle | c) The shedding units |
|------------------|----------------|-----------------------|

Machine –check the different part of the machine and accessories as :-

• SHUTTLE

- 1) Cleaning with compressed air and by hand
- 2) Removing wound tapes
- 3) Checking -

a) Weft tension mechanism	b) Shuttle wheels
c) Magnetic holder mechanism	d) Warp guide & shuttle guide

• ROLLERS:

- | | |
|---------------------------------------|---|
| a) Remove wound tapes | b) Slight oiling of stainless-steel rollers |
| c) Checking maxi-drag or inlet roller | d) Water through sponge rollers |
| e) Take up rollers | |

• CHAINS, SPROCKETS & TIMING BELT TRANSMISSION

- | | |
|------------------------------------|---|
| a) Timing belt condition & tension | b) Take up sprockets and tension of chain |
|------------------------------------|---|

- **MAIN DRIVE**

a) Cam & cam rollers & their caps

b) Main motor for noise and vibrations

- **SURFACE WINDER DRIVE**

a) Chain tension

b) Rollers

- **MISCELLANEOUS**

a) Check the compensator

b) Check the inlet roller and guide rollers for free movement

c) Check the creel peg for free rotation

d) Check the machine for Cross threading

Scan the QR code to see the related video



Shuttle Maintenance

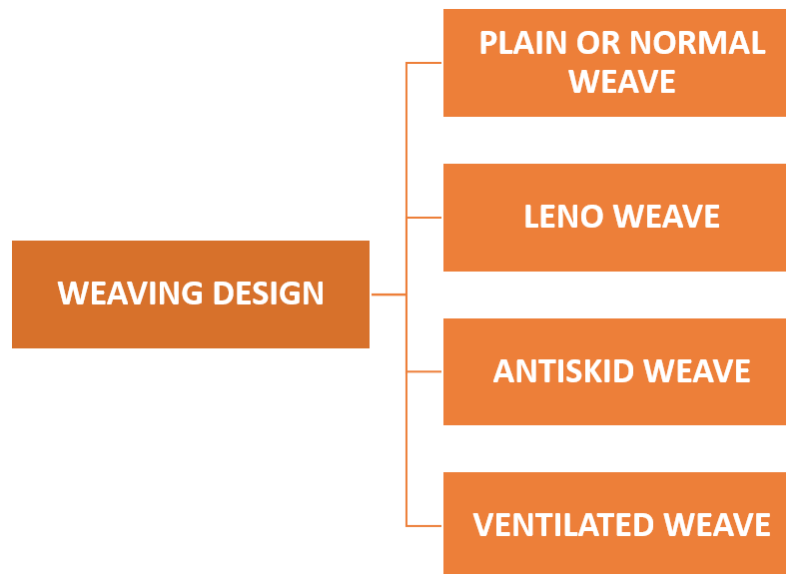
UNIT 5.4: Weaving Designs

Unit Objectives

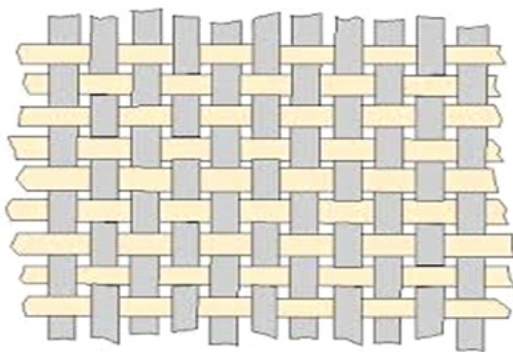
At the end of this unit, you will be able to:

1. Know various weaving design patterns.

5.4.1: Weaving Designs



I. **Plain or Normal weave** - In **plain weave** cloth, the warp and weft tape cross at right angles, aligned so they form a simple cross-cross **pattern**. Ex-Food bag, Cement Bag, Fertilizer Bag etc.

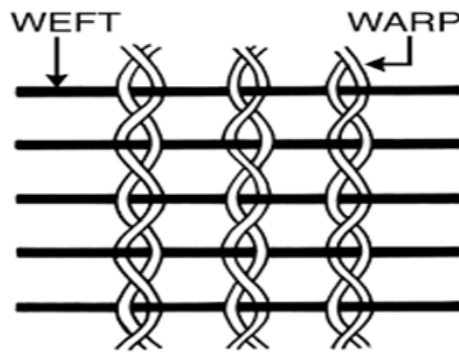


Application

- Agricultural product packaging
- Food packaging
- Tourism and transport
- Daily necessities.
- Flood control products



II. Leno wave :- It (also called gauze weave or cross weave) is a weave in which **two warp tape** are twisted around the weft tape to provide a strong yet sheer fabric. Leno weave produces an open fabric with almost no yarn slippage or misplacement of threads.

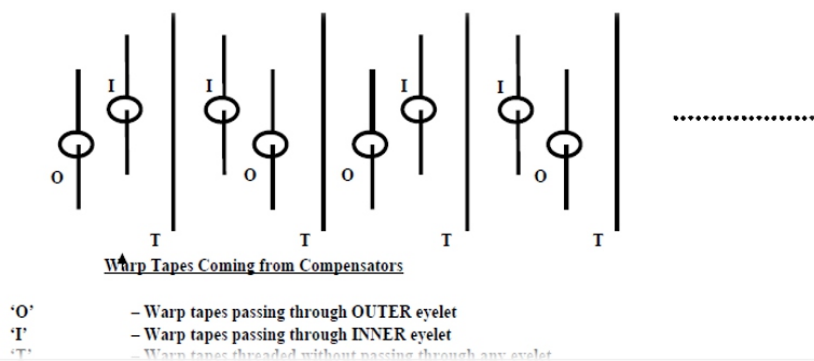


Application

- Produces Bags: - Onion's, Potatoes, Cabbage
- Firewood Bag
- Shellfish Bag
- Mosquito netting

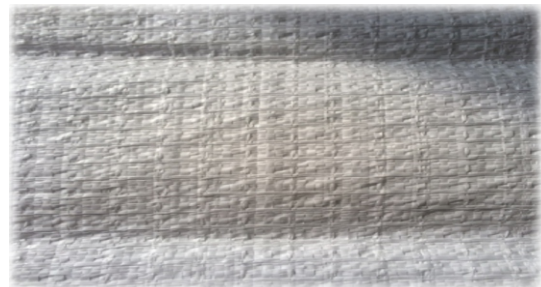


III. Anti - Slip Bag :- Similar Shuttle noses (whether upwards or downwards) are to be fixed on two successive shuttles together. Rest of two shuttles (one with upwards nose & another one with downwards nose) will be put in alternative sequence after first four shuttles.



Application

- These bags don't slip and fall while making huge stacks
- Used in large warehouse to maximize space utilization
- Used for high volume warehousing and logistics to ensure efficiency



IV. Ventilated Weave :- In ventilated weave, the fabric is specially designed to maximize the airflow & to substantially reduce the spoilage of potato and onion occurs due to moisture and mold build-up.



Application

- Used in the packaging of perishable goods like fruits & vegetables as well as firewood, ventilated fabrics also find application in sludge disposal.

Scan the QR code to see the related video



Circular Loom - Nova 6

UNIT 5.5: Formulas related to Circular Loom

Unit Objectives

At the end of this unit, you will be able to:

1. Determine the formula related to circular Loom.

5.5.1: Formulas related to Circular Loom

1. Total no of warp tape	=	Size of fabric (inch) × Mesh × 2
2. No. of groove in Heddle Belt	=	$\frac{\text{Total no of warp tape}}{\text{No of heddle belt}}$
3. Size of Ring	=	Size of fabric (inch) × 16.17
4. Production (Mtr/hr)	=	$\frac{1.524 \times \text{PPM}}{\text{Weft Mesh}}$
5. Production (Kg/hr)	=	$\frac{\text{GPM} \times \text{Production (mtr/hr)}}{1000}$
6. Fabric GSM	=	$\frac{\text{Denier} \times \text{Mesh (Warp + Weft)}}{228.6}$
7. Denier	=	$\frac{\text{GSM} \times 228.6}{\text{Mesh (Warp + Weft)}}$
8. Fabric GPM	=	$\frac{\text{GSM} \times \text{Size of Fabric (Inch)} \times 2}{39.37}$

UNIT 5.6: Formulative Assessment

Unit Objectives

At the end of this unit, you will be able to:

1. Solve question related to Weaving.

5.6.1: Formulative Assessment

1. Maximum dia. of warp bobbin is
a) 110mm b) 150mm c) 120mm d) 80mm
2. Maximum dia. of weft bobbin is
a) 80mm b) 150mm c) 120mm d) 110mm
3. Color of cheese pipe is
a) Green b) Yellow c) Black d) White
4. Length of Circular Loom Cheese pipe is
a) 250mm b) 218mm c) 118mm d) 318mm
5. Diameter of Circular Cheese pipe is
a) 32mm b) 34mm c) 36mm d) 38mm
6. Which Bobbin quality, affects the operation of loom
a) Compensator b) Single tape winding c) Double tape winding d) None
7. Fibrillation relates to
a) Adding of Tape b) Splitting of Tape c) Bonding of Tape d) None
8. Which is the parameter of Circular Loom
a) Shuttle b) Density (Mesh) c) Compensator d) Tape
9. PPM Relates to
a) Parts per minute b) Picks per month c) Picks per minute d) None
10. Magazine winder is used for
a) Low Denier Fabric b) Light Denier Fabric c) High Denier Fabric d) None





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& ENTREPRENEURSHIP



6. Maintain work area, tools and machines in raffia sector



Unit 6.1 - Department House Keeping

Unit 6.2 - General Instructions

Unit 6.3 - Instructions for Loom Operator

Unit 6.4 - Operating Procedure of Circular Loom

Unit 6.5 - Self Assessment



TSC/N9011

Key Learning Outcomes

At the end of this module, you will be able to:

1. Understand how to maintain tools.
2. Understand how to maintain machine.
3. Understand what is cleanliness.
4. Understand how to maintain house keeping.
5. Understand General Instructions & Instructions for Loom Operator
6. Understand Operating Procedure of Circular Loom

UNIT 6.1: Department House Keeping

Unit Objectives

At the end of this unit, you will be able to :

1. Perform and maintain a good housekeeping in the department.
2. Follow the cleaning checklist correctly.

6.1.1: Importance of Department Housekeeping

- Maintaining housekeeping give a comfortable and pleasure working atmosphere.
- Housekeeping avoids accidents and machine breakdowns.



6.1.2: Input Materials and Carriers

- Use Creel trolleys if provided to bring the Bobbin from tape plant and placed in a systematic arrangement on the Loom or at storage place.
- Ensure the trolley wheels are free in rotation and without dust/fly.



UNIT 6.2: General Instructions

Unit Objectives

At the end of this unit, you will be able to :

1. Understand detailed Maintenance for Work Area, Machine, and Tools of a Circular Loom

6.2.1: General Instructions & Maintenance

1. WORK AREA MAINTENANCE:

- Cleanliness: Regularly sweep and clean the floor to prevent accidents caused by clutter or loose materials.
- Organization: Arrange raw materials, finished products, and spare parts in designated storage areas.
- Safety Protocols: Ensure fire extinguishers and first-aid kits are accessible. Keep pathways clear for easy movement.
- Lighting and Ventilation: Maintain proper lighting to reduce eye strain and provide adequate ventilation to dissipate heat and dust.

2. CIRCULAR LOOM MACHINE MAINTENANCE:

Daily Checks:

- Inspect machine components like belts, pulleys, and gears for signs of wear or damage.
- Check for loose bolts, nuts, and fittings and tighten them if necessary.

LUBRICATION:

- Apply the correct grade of lubricant to moving parts such as shafts, bearings, and gearboxes.
- Follow the manufacturer's guidelines for lubrication frequency.

CLEANING:

- Remove dust, fiber debris, and other contaminants from the loom using air blowers or brushes.
- Clean sensors and electronic components carefully to avoid malfunction.

TENSION AND ALIGNMENT:

- Ensure the warp and weft tensions are correctly set to avoid fabric defects.
- Realign guide rails and shuttles to maintain smooth operation.

ELECTRICAL SYSTEM:

- Check wiring connections and inspect for any signs of wear or overheating.
- Test the control panel for proper functionality.

3. TOOL MAINTENANCE:

Cutting Tools:

- Sharpen blades and cutters regularly for precise cuts.
- Replace dull or damaged tools promptly.

Measuring Tools:

- Calibrate tools like rulers, gauges, and micrometres to ensure accuracy.

Hand Tools:

- Inspect pliers, wrenches, and screwdrivers for wear.
- Clean and oil tools to prevent rusting.

4. SAFETY AND PREVENTIVE MEASURES:

- Power Isolation: Turn off and isolate power before performing any maintenance tasks.
- Protective Equipment: Always wear gloves, goggles, and masks to prevent injuries from dust or sharp edges.
- Preventive Maintenance Schedule: Follow a preventive maintenance plan to anticipate and address issues before they cause breakdowns.
- Proper maintenance enhances the loom's performance, ensures product quality, and minimizes downtime, contributing to efficient and safe operations.



6.2.2: Working Tools

- To avoid accident, machine break down and to maintain quality of product, proper working tools to be used for cleaning and handling materials as specified by management



UNIT 6.3: Instructions for Loom Operator

Unit Objectives

At the end of this unit, you will be able to :

1. Determine the Do's and Don'ts for a loom operator.

6.3.1: Do's & Don'ts for Loom Operator

1. Change all shuttle packages at one time. Loading a single package, as it runs- out, is time wasting.
2. Prepare in advance packages of as much near the same size as possible.
3. Rewind, approx. 1-meter pates around the middle of package to prevent tape, slipping of the package.
4. If by chance, 2 looms go down together which is sometimes unavoidable, then place one set of medium or small packages in one loom and one set of large packages in another loom. This ensures that the looms go down at different times for the next change.
5. Creels to make sure no end sure falling off the bobbins. This could cause breaks and machine stoppage.
6. When a tape breaks in a loom, after mending and before starting look inside the reed to check that no pieces of tapes are wrapped around reed roller.
7. Watch compensator always, if one in particular moves backward and forward quickly. This means tape is crossed inside heddle and will eventually break.
8. Make sure that all water troughs are filled with wetting agent or water solution.

DO's :-

1. As a package operation and to avoid slippage of tape during starting of *machine*, rewind approx. 1 to 2 meters of tape in the middle of package.
2. Keep weft package of approx. equal diameter ready, in advance, before machine stops due to weft breakage/exhaustion.
3. Weft packages should always be loaded in sequence by the operators to avoid the stoppage of more than one machine at the same time.
4. Change the entire weft package at same time as quickly as possible.
5. Always press one 'stop' push button at the time of mending warp end or changing weft packages.
6. Have scissors to cut the extra length of warp/weft tape after mending.
7. Remove visible wound tapes from machine's moving parts.
8. Clean photocell lens and reflector mirror at regular intervals to avoid dust/powder formation.
9. Consult supervisor if warp/weft tape breakage frequently.

DON'Ts :-

1. Don't leave broken tape on the machine platform or floor.
2. Don't do cross threading.
3. Don't inch the machine during starting of machine i.e., after changing weft package or after mending 1 or 2 warp ends, machine should be started the help of 'start' push button directly.

4. Don't waste time in putting empty bobbin on bobbin or self-bag. Keep them in apron to reduce down time of machine.
5. Don't allow the machine to remain idle without any proper reason.
6. Don't waste time in preparing weft package when machine is stopped.
7. Don't pull warp tape downward and weft tape in the opposite direction of shuttle movement, after mending a warp/weft tape or changing the package.
8. Don't place scissors, hook spanners or any other object on top of the heddle. They may fall into the loom and cause serious damage.

Scan the QR code to see the related video



Safety Attitudes

UNIT 6.4: Operating Procedure of Circular Loom

Unit Objectives

At the end of this unit, you will be able to :

1. Understand how to operate the circular weaving machine.

6.4.1: Operating Procedure

1. Clean and check the machine for any parts in the central portion.
2. Rotate the machine by hand for about 2-3 rounds to ensure that the cam is moving freely.
3. Set the frequency (25 Hz) in main motor invertors for slow running in beginning.
4. Inch the machine for the while and check the direction of cam. Clockwise direction is recommended.
5. Check the abnormal noise and vibration.
6. Check the direction of rotation of cam, Take up roller and fabric winder.
7. Ensure correct parameter is fed in Circular weaving machine (CWM) controller.
8. Run the machine at a slow speed for some time.
9. Check the functioning of Warp/Weft detection system and magnetic sensor.
10. Ensure proper weaving ring id as per formula given below.
11. $ID = \text{Fabric DFL in mm} \times 2 / 3.14$
12. Check the water in the water tray for Sponge Roller.
13. Check Shuttle assembly parts for free & smooth movement.
14. Start the machine and run continuously.

6.4.2: Safety Instructions

❖ Normal operation:

- Avoid any operating mode that might be prejudicial to safety.
- Take the necessary precautions to ensure that the machine is used only when in a safe and reliable state. Operate the machine only if all protective and safety devices e.g. removable safety devices, emergency shut-off equipment, silencing elements and exhausters, are in place and in good working condition.
- Check the machine at least once per shift for obvious damage and defects. Report any changes to the competent person immediately. If necessary, stop the machine immediately and lock it.
- In case of malfunctions, stop the machine immediately and lock it. Have any defects eliminated immediately.
- Always observe start-up and shut down procedures as well as check if indicators are in accordance with the operating instructions.
- Before starting up or setting the machine into operation, make sure that nobody is at risk.
- Never switch off or remove suction and ventilation devices when the machine is in operation

- Any safety device removed for set-up, maintenance or repair purposes must be refitted and checked immediately upon completion of the maintenance and repair work.
- Do not touch moving parts during operation, if they cannot be protected sufficiently due to technological reasons.
- For cleaning move the machine only by hand.
- If rollers have to be cleaned during operation, do it only at the outlet side.

UNIT 6.5: Self Assessment

Unit Objectives

At the end of this unit, you will be able to :

1. Understand the importance of good housekeeping.
2. Understand all the points to be considered while preparing cleaning schedule in Loom.
3. Understand some Dos & Don't.
4. Understand the importance of Machine cleanliness.

6.5.1: Self Assessment

- How to handle wastage in circular Loom?
- Brief about operating procedure of Loom?
- Mention some of the faults come while operating Loom.
- What precaution to take to prevent size variation in fabric?
- What are the benefits of maintenance of Loom?

Notes



7. Working in a team in raffia sector



Unit 7.1 - Advantage of Team Work

Unit 7.2 - Being a successful team player

Unit 7.3 - Faith in team work

Unit 7.4 - Initiate for development

Unit 7.5 - Effective communication

Unit 7.6 - Active involvement in discussion

Unit 7.7 - Discussion Vs Argument

Unit 7.8 - Ethics in discussion

Unit 7.9 - Commitment on collective decision

Unit 7.10 - Dos and don'ts



Key Learning Outcomes

At the end of this module, you will be able to:

1. understand how to work as team.
2. understand how to work with self responsibility.
3. understand what is communication.
4. understand different between Discussion Vs Argument

UNIT 7.1: Advantage of Team Work

Unit Objectives

At the end of this unit, you will be able to :

1. Lead a team and perform well to achieve the goal.
2. Communicate the message among team members without affecting the theme of content.

7.1.1: Team

- TEAM means **T**ogether **E**ach **A**chieve **M**ore
- Risk and time delay task can be easily completed by working as team.
- Working with team gives more benefits than working with individual
- Working with team will save time in achieving the target
- We can know more details /information about the task from our team members.
- Mutual understanding between members will improve
- We can overcome unwanted conflict
- Physical support will be get from members
- Level of deviation will be minimized
- Confidence level increases with team to achieve the target



UNIT 7.2: Being a Successful Team Player

Unit Objectives

At the end of this unit, you will be able to know:

1. How to become a successful team player.

7.2.1: A Successful Team Player

- Cooperating with other team members is main criteria for a successful team player
- Avoid implementing your thoughts and ideas without discussing with other members about pros and cons
- Have open discussion among the members to avoid misunderstanding
- Lead the team with involvement and interest
- Support and guide the members in difficult situation

Scan the QR code to see the related video



Industrial Safety

UNIT 7.3: Faith in Team Work

Unit Objectives

At the end of this unit, you will be able to know:

1. The Important things to follow in Team work.

7.3.1: Faith in Team Work

- Believe other team members
- Allow other members to talk in discussion



Fig. 7.3.1.1: Group discussion

- Respect their views

UNIT 7.4: Initiate for Development

Unit Objectives

At the end of this unit, you will be able to know:

1. The important things to initiate development.

7.4.1: Development

- Come forward to take task
- Prepare action plan before starting the task
- Consider the company policy / Standards in preparation of action plan
- Explain to team members about the task
- Give necessary support to others to understand the policy / standard's
- Get their suggestion
- Encourage the team members
- Give importance of their points even though it is not much worth



Fig. 7.4.1.1: Development

UNIT 7.5: Effective Communication

Unit Objectives

At the end of this unit, you will be able to know:

1. The important things for effective communication.

7.5.1: Effective Communication

- When working as a team, communication plays a vital role for the success of the task
- Miscommunication among the team members leads to breakdown the task
- You should clearly communicate the management policy to others if they are not clearly understood
- Communicate the message to other members politely and clearly
- If any problem faced during the task, inform to the superior immediately with proper details like machine no., area, etc.
- While communicating to other departments, provide clear information about machine number, process details, time etc.

UNIT 7.6: Active Involvement in Discussion

Unit Objectives

At the end of this unit, you will be able to know:

1. The important things for active involvement in discussion.

7.6.1: Involvement in Discussion

- Before starting the task, have a discussion among the team members about the task and plan
- Involve with interest in the discussion
- Make everyone to take part in the discussion
- Avoid unnecessary/ useless talks which is not relevant to the task



Fig. 7.6.1.1: Useless talk to avoid during discussion (Red marked)

- You initiate the discussion
- Get information instead of questioning in discussion
- Give chance to other members to talk
- Listen their talk keenly
- Any controversy appears in discussion, find a way and means to solve the problem by involving oneself
- If necessary seek your superior's guidance to solve the matters of discussion

UNIT 7.7: Discussion Vs Argument

Unit Objectives

At the end of this unit, you will be able to know:

1. The difference between discussion and argument

7.7.1: Discussion Vs Argument

- Discussion is a good thing for long time. It will create good relationship between members of a team and also improves our concentration and involvements.
- Argument in a team creates bad remark about a team and will leads to loss of time. Sometimes it creates conflict and bad remarks about some ones.
- Discussion makes team members to improve their knowledge
- Argument makes team members to disappoint
- Discussion leads to creativities of good thoughts
- Argument leads to unnecessary worries
- Discussion helps to achieve the task easily
- Argument spoils the task completion



Fig. 7.7.1.1: Group discussion and Argument (Positive and Negative)

UNIT 7.8: Ethics in Discussion

Unit Objectives

At the end of this unit, you will be able to know:

1. The importance of ethics in discussion.

7.8.1: Ethics

- Self-discipline is must to work as a team
- Give attention in discussion
- Avoid interrupting while other members talking
- One person to talk at a time in discussion
- Others should observe the points
- Any points need clarification ask politely
- If different opinion comes, express it gently
- Accept the opinion without resistance for the sake of team work
- Appreciate others view
- Initiate the changes /Acceptance from you

UNIT 7.9: Commitment on Collective Decision

Unit Objectives

At the end of this unit, you will be able to know:

1. The importance of commitment on collective decision.

7.9.1: Commitment

- Discussion is carried out to get a best output of activity to achieve the task
- Discussion is made to get a common point's of follow up to achieve the task
- Discussion is made to involve all members to take part in task
- Once the decision is taken together, each and every one of the team to work towards it
- No other discussion to be carried out once the decision is take
- Periodical Review meeting to be conducted to know the status of task
- In case of failure in task, take it in positive way and analyses it.
- Avoid critics other and take responsibility on own
- If any changes are required, do it after discussion
- To take part in the discussion with Wholly hearted mind



Fig. 7.9.1.1: Group discussion with involvement

UNIT 7.10: Do's and Don'ts

Unit Objectives

At the end of this unit, you will be able to :

1. know about the dos and don'ts of team work.

7.10.1: Do's and Don'ts

S. No.	Dos	Don'ts
1.	Work as a team	Working independently
2.	Show involvement in discussion	Not showing involvement in discussion
3.	Take decision with discussion	Taking decision on own
4.	Extend co-operation to team members	Not co-operating to team members
5.	Avoid argument during discussion	Making argument in discussion
6.	Don't critics others for failure	Making critics for failure
7.	Avoid interrupting while others talking	Interrupting while others talking
8.	Accept the different opinion to the sake of team	Not accepting the different of opinion
9.	Listen others talk in discussion	Neglecting others talk
10.	Support to team members to complete the task	Not supporting the members to complete the task

Table 7.10.1.1: Dos and don'ts

Tips

- Work with team for better result in a task
- Discuss and achieve the common points with team
- Avoid conflict and argument
- Co-operate with team members would helps to achieve good result
- Understand the company policy and prepare the plan to achieve the task
- Have Periodical review meeting and discuss the status of task
- Avoid critics and encourage team members in case of failure

Self-Assessment

- What are the advantages of team work?
- How to be a successful team player?
- Brief about effective communication
- Distinguish 'Discussion Vs Argument'
- Brief about ethics of discussion
- Mention some does & don't (Any Five)

Exercise

- Form a team and act as a team member as well as team leader
- Communicate a comment to colleague as per the superior instruction for effective communication

Notes



8. Maintain health, safety and security at work place in raffia sector



Unit 8.1 - Ensure the Health and Safety Instructions at Workplace

Unit 8.2 - Personal Protection Equipment

Unit 8.3 - Follow up of Work Specification Guideline and Procedures

Unit 8.4 - Tips to Healthy Life,

Unit 8.5 - Care on Environmental

Unit 8.6 - Unsafe Conditions at Workplace,

Unit 8.7 - Material Storage

Unit 8.8 - Methods of Waste Disposal

Unit 8.9 - Self Discipline in Safety

Unit 8.10 - Prevention of Unsafe Condition

Unit 8.11 - Fire Fighting

Unit 8.12 - First Aid

Unit 8.13 - Planning and Implement Safety Techniques

Unit 8.14 - Dos and Don'ts



Key Learning Outcomes

At the end of this module, you will be able to:

1. Understand the importance of health and safety.
2. Understand how to be part of a safe working atmosphere.
3. Understand how to lead a healthy life.
4. Understand how to identify hazards and act proactively to avoid accidents.
5. Understand the different type of fire and extinguishing methods.
6. Understand the importance of first aid and general procedure of first aid.

UNIT 8.1: Ensure the Health and Safety Instruction at Work Place

Unit Objectives

At the end of this unit, you will be able to :

1. Meticulously follow the safety instructions.
2. Maintain a healthy life without any bad habits.
3. Identify the hazards in advance and could initiate preventive measure.
4. Handle the emergency situation like fire, personal accident etc.
5. Be a self disciplined with respect to Health and safety.

8.1.1: Health and Safety Instruction at Work Place

- In workplace Instructions related to Health and safety is communicated through various methods like Sign boards, Text message displays, Lighting, Alarms, etc.
- Communication through Sign boards, Text message, Lighting, Alarms etc., attracts and reaches the person immediately
- The exhibits are kept in critical places



Fig. 8.1.1.1: Safety Sign Display boards
"way to preparatory"



Fig. 8.1.1.2: Safety Sign Displays



Fig. 8.1.1.3: Safety Display as Text



Fig. 8.1.1.4: Emergency signal lamp



Fig. 8.1.1.5: Emergency signal Siren

- Understand the instruction given or displays in the work place
- If not clear with the instruction, get guidance from your superior
- Health and safety class is conducted for new comers before inducting into the job to educate about it
- Follow the health and safety instructions properly

UNIT 8.2: Personal Protection Equipment (PPE)






Unit Objectives

At the end of this unit, you will be able to :

1. Use PPE's perfectly.
2. Know the importance and uses of PPE's.

8.2.1: Personal Protection Equipment (PPE)

- Self-protection is must while working in or near moving parts and machines
- Wear the safety protection tools like Cap, ear plug, nose mask, shoe, apron, provided by the organization before entering into the work spot
- Carelessness in wearing causes injuries and health decease
- Some of the important PPE's used in industries are as under

Fig. No.	Image of PPE	Name and usage
Fig. 8.2.1.1:		Head cap : To protect our head and hair (plaiting or loose hair) not to get in moving parts
Fig. 8.2.1.2:		Nose mask : To protect from micro dust Use the face mask cleanly Don't use other's mask Use good quality mask
Fig. 8.2.1.3:		Ear plug : To protect our hearing ability by blocking the noise entering in to ears Wear the ear plug correctly. Wash the ear plug frequently
Fig. 8.2.1.4:		Apron / Over coat : To avoid loose wears caught in moving / rotating parts and cause personal accident. Wear the apron/Over coat tightly, Correctly and without loose ends
Fig. 8.2.1.5:		Shoe : To protect our feet from hit injuries due to Falling objects and tumble down etc. Protects also while stepping in Electrical line, slippery area. Avoid wearing damage Shoe. Wear correct size shoe.

UNIT 8.3: Follow up of Work Specification Guideline and Procedures

Unit Objectives

At the end of this unit, you will be able to :

1. Know the organization guidelines and procedures to be followed.

8.3.1: Work Specification Guideline and Procedures

- For every activity, there is specific guidelines or procedures to do the work without any deviation or defect
- Guidelines and procedures are prepared based on the working condition and availability of sources
- Following the guidelines lead to trouble free, defect free, accident free working atmosphere
- Also it keeps us in safe guard from personal accidents and also our people working in and around
- By Following the guidelines or procedures, a uniform method of working is spelt out in work places
- Operator should refer the guideline in case of any doubt
- Operator should fully understand the guidelines or procedures. Any clarification sought in this regard must be sorted out by superior
- So strictly follow the activities in line with the approved guidelines and procedures without fail
- Besides oneself, one has to ensure the follow-up of our team and coworkers around us since deviation from guidelines/procedures by our team member or coworkers cause untoward incident
- Whenever you found procedure deviation, immediately ask the respective person to correct himself by explaining the importance and its cause and effect
- Based on internal nonconformity and accidents, the safety procedure is normally reviewed, revised and notified to all concern . So, one has to check for that changes regularly and ensure the revised follow-up without fail
- Also the changes should be conveyed to every team member, incoming operator and other coworkers around us

UNIT 8.4: Tips to Healthy Life

Unit Objectives

At the end of this unit, you will be able to :

1. Follow the tips for healthy life.

8.4.1: Tips to Healthy Life

- Healthy life makes us to live longer with wealthy life and Health is wealth
- Healthy life is important for human being to work actively and effectively
- Self discipline and good habits are most important for our healthy life
- Drink sufficient water which is a simple preventive medicine to avoid lot of our health related problems
- Always eat with happiness, maintain limit and avoid improper timings
- When one enters the work spot, try to leave everything in the mind concerning outside problems
- Ensure a balanced diet and avoid excess fat, sugar, salt, spice etc., Also in the other end don't starve of required nutrients
- Be happy always. Happiness is our decision and in any situation we can be happy if we strongly believe that our happiness doesn't depend on others and materials



Fig. 8.4.1.1 Good Habits



Fig. 8.4.1.2 Discipline

- Avoid intoxicants like consuming alcohol, Tobacco, drugs etc .,
- Keep yourself clean by following good habits like Brushing teeth, Bathing, Wearing washed cloth, etc. daily for healthy life
- Always maintain your surroundings spic and span, airy, and free from congestion, unwanted materials, waste etc .,
- Make others feeling happy with your posture



Fig. 8.4.1.3 Mill surroundings with spic and span

UNIT 8.5: Care on Environmental

Unit Objectives

At the end of this unit, you will be able to :

1. The information of care on the environment.

8.5.1: Environmental Care

- Safe and good Environment is most important for not only human being, entire life of our mother earth
- In our universe out of crores and crores of planets only our earth supports life. It is god's gift and everyone is responsible to keep our environment clean, safe and good
- If environment gets polluted, it means that entire life will be under threat of extinction, especially as a human being we have more responsibilities in protecting our environment
- Changes needed in our life style for being environmental friendly are
- Avoid any kind of wastages (Energy, Materials, Water, Human and machine resource etc.) leading to dumping in backyard/squeezing the cost of production
- Avoid over usage of everything (Energy, Materials, Water, Nature, Renewable sources etc.) and use it economically since the availability becomes scarce
- Dispose of all kinds waste as per standard and with safe procedures



Fig. 8.5.1.1: Disposal of waste in waste trolley

- In our work spot, we can do lot of things related to the above points like
- Unnecessary usage of lights, fans and idle machines may be switched off wherever possible
- Water wastages may be avoided everywhere
- Utilize effectively and achieve maximum efficiency in Draw frame machines
- Avoid the micro dust in the air by cleaning frequently etc.,
- Support the organization's environment management system through dedicated follow up of its procedures and with proactive suggestions
- Last but not least, we have always to spread the news about safe environment awareness to the extent that we are able to do. Like educate our family members, our team, our neighbors, our colleagues, even unknown person caught in our sight

UNIT 8.6: Unsafe Conditions at Work Place

Unit Objectives

At the end of this unit, you will be able to :

1. know about the unsafe conditions of work place.

8.6.1: Unsafe Conditions

- Unsafe condition leads to accident causing damage of machine parts or human parts
- Permanent Damage in human parts affects our healthy life
- You should be able to know the safe / Unsafe condition of spot or activities in work area
- Any unsafe condition found in the work sport, it should be immediately corrected or addressed properly to the superior or concerned person
- If you feel any abnormal sound or smell in work spot correct it or inform to concerned person
- Any abnormal conditions in parts, activities, feel etc. correct it immediately. If the corrective action is beyond your limit, inform to superior or concerned persons immediately and get the guidance
- Also get clarification from superior and be thorough of the situation for avoiding the repetition
- When you inform to your superior or concerned person, mention clearly the place, machine no, condition etc., correctly
- In necessary give the information through written form also

Scan the QR code to see the related video



Implementing Health & Safety
in Workplace

UNIT 8.7: Material Storage

Unit Objectives

At the end of this unit, you will be able to :

1. Store the materials as per the organizational guidelines with safety.

8.7.1: Material Storage

- Material, equipment and tools are to be kept in proper way / method that not affecting the condition of the material (any damage), the surroundings and disturbance to movements
- Some basic material storage concept as per 5S are (Japanese techniques for material storage / good housekeeping and work culture)
- Remove all unwanted materials from working area. Even occasionally / rarely used materials also to remove from working area
- Identify and allocate a suitable place for individual material. If required special storage racks, stands, to design for individual materials for user friendly handling. While allocation of place and or design of storage items consider the below points
- For frequently used material to store in a place easy to retrieve
- Heavy material to store in bottom racks to avoid accidents
- Light material may store in higher place
- For consumables items in store in a visible manner and mark reorder level & Quantity
- On any occasion stored material need not be disturbed for taking / storing another material nearby
- Try to design that the storage place should easy enough to identify and put back after its use. Like a tools storage box shown below
- Ensure any kind of loss during storage
- Inflammable, dangerous and hazardous material should be stored as per government norms & regulations and take extra care to avoid any kind of accidents
- Display the storage material details in a suitable manner, it may be written display or signs, material identity, outer line drawing, etc.
- Train each and every individual to follow the procedures defined for storage of materials and ensure its strict follow-up
- Take safety measures like keeping fire extinguisher, providing alarms, keeping caution displays, properly in dangerous places like electrical panel
- Also suitable first aid arrangement should be kept for ready use in need of place in the storage area.



Fig. 8.7.1.1: Extinguisher kept in the wall with necessary identification

UNIT 8.8: Methods of Waste Disposal

Unit Objectives

At the end of this unit, you will be able to :

1. dispose the wastes in proper method.

8.8.1: Waste Disposal Methods

- As per the standard operating procedure ensure the waste disposal, considering no damages for person, place, machine and environment.
- Understand the procedure clearly. In case of any clarification required get guidance from superior.
- Dispose the waste then and there with proper method and keep the work spot clean.
- Before disposal ensure proper weightment and recording the data.
- Use proper tools, trolleys, to dispose the waste
- Use sweeping brush stick to clean the floor with easy handling



Fig. 8.8.1.1: Clean work area



Fig. 8.8.1.2: Waste box used for waste collection

- Use bins to collect the waste materials produced in production process
- Transport it to the godown or the mentioned place using suitable transport equipment

UNIT 8.9: Self-Discipline in Safety

Unit Objectives

At the end of this unit, you will be able to :

1. know the self-discipline in safety.

8.9.1: Self-Discipline in Safety

- Most of the risk and accident or damage happens due to human error
- Human error like mishandling of tools, not following the procedures, Negligence, Carelessness etc. cause more risk to the life
- Operator should maintain self discipline like following the code of work, following the rules and regulations of the organization correctly or as prescribed in stand alone manuals
- Wear personal protection equipment provided to eliminate the safety risk

UNIT 8.10: Prevention of Unsafe Condition

Unit Objectives

At the end of this unit, you will be able to :

1. know about the prevention of unsafe conditions.

8.10.1: Prevention of Unsafe Condition

- Machine is used for a continuous process around the clock and there are some sorts of wear and tear in running parts in due course and have the chances of getting damages
- Under machine maintenance activities, the machines are diagnosed to find out any wear and tear of parts in advance for its replacement
- Machines, tools, equipment trolleys are handled by various operator which may lead to parts damages for which suitable guards must be provided
- Such kinds of conditions are leading to unsafe condition, if not corrected, replace it in time
- Operator should able to find out the unsafe conditions and kind of possible hazards in the machine and surrounding of the machine
- Give more importance for even a small deviation in safety aspects like improper lighting, lighting with low lux, Safety cover damage / missing / open condition, leakage in air / chemical solution, etc., and immediate action should be initiated for correction
- List out the parts/ area/ spot to be checked in patrolling like gauge, indicators, stuff level, safety door conditions etc., as per the superior instruction
- Go around the machine and work spot in periodical intervals and check the parts and condition to know the actual situation
- Give importance for abnormal sound, smell heat etc., which may cause potential hazard
- Don't keep or stack any material on the alley ways, near electrical panels, fire extinguishers, emergency exits etc., to avoid accidents and put in difficult situation during emergency evacuation
- Don't keep inflammable things near electrical panel
- Ensure that the emergency exit door is designed in such a way that it should be opened on pushing it when come from inside to ease the emergency evacuation
- Any unsafe condition noticed should be corrected immediately . If necessary, place a warning display about the condition till its correction ticed should be corrected immediately. If necessary, place a warning display about the condition till its correction
- Inform superiors or concerned person with proper details immediately to take action against
- Keep the tools and equipments in its specified place after use.
- Avoid keeping unwanted materials in work place which disturb the work and some time leads to accident
- Always ensure the effectiveness of corrective action in practical way by cross checking

UNIT 8.11: Fire Fighting

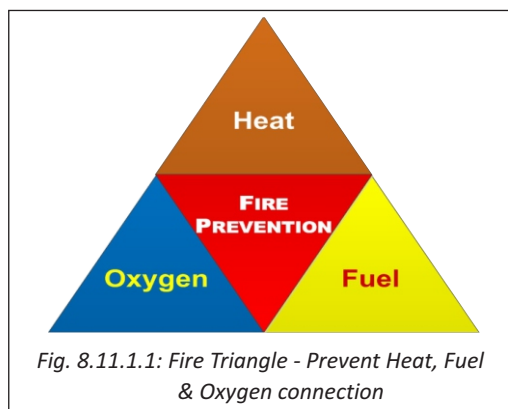
Unit Objectives

At the end of this unit, you will be able to :

1. know the types of fires and its fire fighting equipments
2. know the action to be taken during the fire accident

8.11.1: Fire Fighting

- Fire is dangerous hazard causing major loss to materials, material part or human body
- Operator should take more care on this type of hazards
- To protect from the fire hazard and to control the hazard, operator should have awareness about safety
- Fire is a combination of fuel, heat and oxygen. In this heat and oxygen are not visible and it can be felt only. On the other hand, Fuel is only visible
- Always avoid a situation or action combining these three at a time to avoid fire hazards
- Fire is classified based on the fuels






Fire Classification  Know How To Handle It			
Classes Of Fires	Types Of Fires	Picture Symbol	Extinguisher
A	Wood, paper, textiles, etc		Water Foam Spray ABC Dry Powder Class F Wet Chemical
B	Flammable Liquids		Foam Spray ABC Dry Powder Carbon Dioxide
C	Flammable Gases		ABC Dry Powder
D	Metal		Class D Powder
F	Cooking Oil and Fat fires		Class F Wet Chemical
	Electrical		ABC Dry Powder Carbon Dioxide

Fig. 8.11.1.2: Classification of fire

- Each type of fire should be extinguished with proper extinguisher like water type, foam type, powder type, and gas type
- Improper usage of extinguisher makes the condition serious instead of solving it
- At any cost water should not be used as extinguisher for electrical fire
- Operator should aware of fire type and extinguishing methodology
- Operator should take part in the mock drill conducted by the safety persons and knows how to handle the emergency situation
- Operator should know to safe guard the material form fire accident and to give first aid treatment to the victim of fire accident
- Also operator should know the emergency exit, evacuation procedure, safe assembly point location and its importance to safe guard yourself and others
- After noticing the fire immediately cut off all electric supply near the area by switching of main supply and announce through fire alarm and run for the help with shouting as "Fire, Fire "to communicate all nearby
- Low intensity of fire can be extinguished with fire extinguisher & water hose reel. For fire of high intensity, fire hydrant is to be used

- If the fire is beyond our control, inform to Fire service persons for attending it. Contact detail of our India's fire service is 101. Ambulance service 102. Normally it is displayed in the entrance of any industry
- Give proper information like type of fire, its intensity, Location, easy / shortest way, Landmark to reach. Proper information of its location makes them to act quickly
- Timing is so important in extinguishing the fire. Earlier action eases the extinguishing. Delay even a minute give a place for spreading the fire and may cause huge loss to life and property



Fig. 8.11.1.3: Different type of fire extinguisher



Fig. 8.11.1.4: Fire Hose reel - for small fire



Fig. 8.11.1.5: Water hydrant -For big fire



Fig. 8.11.1.6: Display boards for emergency exit

- In case of emergency, everyone should exit from the spot and assemble in the "Emergency Assembling Point", which helps to ensure that everyone comes out from danger

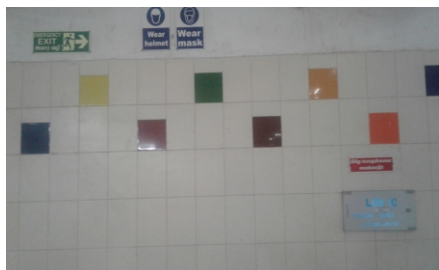


Fig. 8.11.1.7: Emergency evacuation plan



Fig. 8.11.1.8: Safe assembling point

- Also help others to evacuate from the spot when a fire is broken out
- At time of danger situation, gives 1st importance to life and then material if possible
- Also during fire, try to remove the nearby material to avoid spreading of fire. If couldn't remove immediately, use fire extinguisher over them

UNIT 8.12: First Aid

Unit Objectives

At the end of this unit, you will be able to :

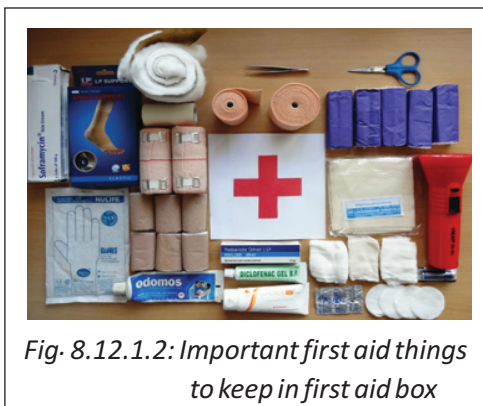
1. know what is First aid and its importance.
2. know the first aid materials and its uses.

8.12.1: First Aid

- First aid is an action taken to save the life of victim from fatal injury time with available sources
- Injuries causes fatal if treatment is not taken / given in time
- Operators should be able to do first aid in time of accident to save a life. Necessary to have first aid training from authorized first aid trainer
- Conduct first aid to others after ensuring your safety first
- Carefully do the first aid as per the procedure
- Keep in mind that victim should be taken to nearest hospital after doing first aid without fail
- Ensure the availability of the first aid kit box in important places and also at the possible hazard causing places
- Ensure the First aid kit is properly identified with specified symbol.



- Ensure the availability of basic common medicine and tools like cotton, bandage, plaster, scissor, torch, ointments, etc. in first aid box



UNIT 8.13: Planning & Implement Safety Techniques

Unit Objectives

At the end of this unit, you will be able to :

1. Know the importance of planning and safety technique procedures

8.13.1: Planning & Implement Safety Techniques

- Planning is a procedure of steps to follow without causing or lead to cause accident
- Planning is framed with different measures based on the nature of work, working environment, equipment and tools and product processed
- Operator should know the different measures to curb the hazard
- Proper planning avoids accident and ensure a safe working environment
- Even though the safety is an individual's care, it should be followed by whole team
- So know the safety plans thoroughly and communicate to others also to follow
- Quality systems like SS, ISO-9000, ISO-1400 help to create a safe working environment
- Sufficient fire extinguisher is to be provided wherever necessary
- LOTO system is to be used in all running machine and electrical related work places



Fig. 8.13.1.1: LOTO (Lock Out Tag Out)

- LOTO is a full proof safety system. Any machine stopes for any maintenance/ repair/ service work to lock the main electrical switch to avoid unexpected machine running
- Refilling offire extinguisher as per schedule to follow exactly
- Assembly point to mark with proper display to reach in case of emergency. Assembly point location and its way to be shown in the mill entrance and all over department
- Selection of assembling points should be such that it can be reaches from all direction and all places with some ease
- Periodic training/ awareness classes and mock drill on safety to be conducted Necessary fire fighting training to be conducted and making others to take part Give prime importance to implement the safety techniques
- Don't compromise the deviation in implementation and follow up
- Plan to give first aid training for sufficient person and ensure that at least one first aid trained person should be in each department and each shift
- Display caution boards where ever necessary



- Conduct frequent meeting and give awareness to all
- Ensure whatever implemented is followed correctly by periodical check/ check list

UNIT 8.14: Dos and Don'ts

Unit Objectives

At the end of this unit, you will be able to :

1. know about the Dos and Don'ts related to Health & Safety.

8.14.1: Dos and Don'ts related to health & safety

Some Dos and Don'ts related to Health & Safety.

S. No.	Dos	Don'ts
1.	Check the safety points during shift take over time	Not checking the safety points during take over shift
2.	Wear PPE while in work spot	Working without PPE
3.	Follow the safety rules	Neglecting the safety rules
4.	Get proper instruction from superior before starting the work	Start working without superior's instruction
5.	Ensure the correct RH% in department	Not bothering about RH%
6.	Follow the indication lamp signals for interruption	Working in assumption
7.	Keep the exhaust creel clean	Dumping waste in exhaust creel
8.	Use trolley for doffing	Not using trolley for doffing
9.	Replace the tools In specified place after use	Keeping the tools some wear lese.
10.	Dispose the waste in periodically as per the instruction	Not following the instruction.
11.	Clean the machine as per the schedule using tools	Not following the schedules
12.	Keep the alley way neat	Keeping materials in alley way/foot path
13.	Doing fire fighting with knowledge	Doing without knowledge

Table 8.14.1.1: Dos and don'ts

Tips

- Maintain good health. Then only you can achieve best result
- Work with wearing PPEs properly would be safety for you
- Classification of fires like A, B, C, D, F and extinguishing procedures
- Known about water type, foam type, powder type and gas type fire extinguishers
- Usage of emergency exit at emergency period would be safe to all
- About assembling point and its importance
- First Aid methods and its importance

Self-Assessment

- What is PPE?
- Give some points for healthy life
- What are the types of fire?
- What are the types of fire extinguishers?
- What is the purpose of emergency exit?
- What is LOTO?
- Brief about First aid
- What are the basic common materials to keep in first aid box?

Notes



9. Comply with industry and organizational requirements in raffia sector



Unit 9.1 - Self Development

Unit 9.2 - Team Work

Unit 9.3 - Organizational Standards

Unit 9.4 - Industrial Standards

Unit 9.5 - 5S

Unit 9.6 - Kaizen

Unit 9.7 - Non-Conformities

Unit 9.8 - Dos and Don'ts



Key Learning Outcomes

At the end of this module, you will be able to:

1. understand about self–development how to develop yourself.
2. understand how to raise in the career ladder.
3. understand about team work and how to be a best team player.
4. understand about organizational standards.
5. understand about 5s and Kaizen and its importance in your career.
6. understand about nonconformity and its disposal procedure.
7. understand about importance of industry standard

UNIT 9.1: Self-Development

Unit Objectives

At the end of this unit, you will be able to :

1. develop yourself in your career through proper planning and execution
2. be a good team player and patient listener to others views.
3. maintain your work place neat and tidy through 5S.
4. develop small Kaizens.
5. handle the non-conformities.
6. work according to the Organization standards.
7. comply to the industrial standards

9.1.1: Self-Development

- **Value of your Job**
 - Textile is a combined process of cloth manufacturing
 - Cloth is the second commodity full filling the whole humanity in the world after food
 - Especially in Indian culture Cloth is more important than food
 - Textile process is known as a process of holiness to mankind
 - So, be proud to be a part of the textiles.
- **Responsibility**
 - Work with self-interest, involvement, dedication, sincerity. Take ownership of your machine, process, delivered product for the stipulated time period of your shift
 - Take responsibility for your every action.
 - Maintaining the machine always in best maximum productive condition
 - Checking the performance in terms of productivity and quality of material
 - Maintaining the cleanliness of the machine
- **Positive Attitude and Continual Improvement**
 - Think positively in all aspects. For any kind of deviation in your assigned work, accept it as generously with whole hearted mind and correct it to avoid it in future
 - Try to make efforts to simplify the work methods and systems to reduce strain, improve quality and productivity
 - Try to solve the deviations / non-conformity in your process / machine.
 - Interact with others and get positive matters from them
 - Don't bother about the negative matters and Just ignore it
 - Always work for the sake of organizations development
 - Development of organization and yourself are interdependent. If the organization grows, you will also grow
 - Take initiative to implement the procedures and think innovative for betterment

- **Learning**
 - Think that every day is a learning day and every situation is for learning
 - We can learn lot of things from our surroundings, Happenings, persons, Mistakes, etc.,
 - Don't think that the point is from whom, think that the point is what and whether it would create goodness for anyone
 - Learning will complete only when it is tried / applied. Before application ensure through learning
 - During initial try, ensure some close observation / follow-up and fine tune the things needed to make it success
 - If fails after dedicated efforts mean, no need to disappoint, as most of the success are learnt from failures
 - Learn and make others to learn for the improvement of yourself and the organization. Also the purpose of learning will fulfill only when it is shared
- **Career Growth**
 - Know about your career growth and fix a target line to reach it
 - Based on target draft an action plan with time line to reach that target
 - What is the additional education required
 - What are all the skill set required
 - Financial requirement
 - Time to learn and develop the education and skill
 - Execute the plan meticulously as per the time line and quality of learning
 - Once you got the required education and skill, inform the management about your new learning. It will lead to your self-development in your career
- **Follow-up of Statutory and Mandatory Procedures**
 - Understand the rules and regulations specified in the standing order applicable to the mills and follow them properly right from reporting for duty to Handover the duty
 - Don't violate safety regulations at any situation, do not fail to wear personal protective equipments while working in the shop floor
 - Don't violate the disciplinary procedures and follow the code of conduct

UNIT 9.2: Team Work

Unit Objectives

At the end of this unit, you will be able to :

1. know what is Team Work.
2. know the qualities required for a good team member and benefits of team work.

9.2.1: Team Work

- "TEAM" the word itself tells us that if you work **T**ogether, **E**ach will **A**chieve **M**ore benefits
- Working with team gives lot of benefits and the impact of result is more than working independently
- It is always better to work with team

9.2.2: Qualities Required for a Team Member

- Should have immense faith in Team and Team work
- Ability to communicate effectively and politely
- Ability of Adoptability to changes & cooperating with members and others
- Mind of respecting voice of another member's
- Sharing of views and ideas to others & ability of open discussion among members
- Able to convince others point if it is not suitable, avoid arguments and have a productive discussion

9.2.3: Benefits of Team Work

- Target and Task can be completed in time with ease
- Risk factor will reduce. Quality, quality consistency productivity will improve
- Accidents and waste level will reduce
- Moral support in working improve confidence level
- Anyone may not know everything but everyone may know something is the base for any Team work. This will lead to new innovative things for a identical problem / situation
- Learn new things through common discussion in a team
- Different kind of Interpretation for a same subject lead to wide open our mind
- Good attitudes like, patient hearing and understand others point of view, helping others Positive approach, cession etc.
- New idea emerges from team work
- Individual ability increases with team work

UNIT 9.3: Organizational Standards

Unit Objectives

At the end of this unit, you will be able to :

1. know the importance of organizational standards.

9.3.1: Organizational Standards

- Organizational standards are the outline of the way in which business is to be conducted and govern what is deemed as acceptable behavior in the workplace
- Organizational standards are established related to
 - Customer service
 - Code of conduct
 - Human resources issues
 - Quality assurance
 - Legislative issues
 - Marketing material and communication
 - Documenting standards like, Mission, Vision, workplace policy and procedures.
 - Standard operating procedures
- Organizational standards includes lean management, 5S, ISO-9000, ISO-14000, Kaizen, Quality circle etc.,
- We should know about the organization standards related to our work before starting
- Any clarification needed in understanding the standards, feel free to get guidance from your superior or concerned person
- Implement and follow the standards applicable for your work and work environment without deviation
- Observe the performance and behavior of the colleagues, helpers and others inside the factory and motivate them to follow the rules and regulations, work instructions, safety practices, etc.,
- Whenever there is any violation / deviation immediately motivate to follow the organizational standards meticulously
- Always update yourself about the changes effected in the organizational standards and be the first one to implement and follow the new changes
- Any changes required in the organizational standard, based on internal nonconformity, Customer compliant, Accidents, etc., should conveyed to concern for necessary amendment

UNIT 9.4: Industrial Standards

Unit Objectives

At the end of this unit, you will be able to :

1. know the importance of Industrial standards.

9.4.1: Industrial Standards

- Industrial standards are established in line with labour legislations of State and Central Government, safety standards of inspector of factories, fire precautions, fire fighting, first aid, ISO standards, environment standards, National Occupations Standards, etc.,
- Industrial standards are also known as a set of criteria within an industry relating to the standard functioning and carrying out of operation in their respective fields of production
- Generally, it is nothing but a statutory / mandatory requirement that should be followed by every member
- It provides an orderly and systematic formulation, adoption or standards used in industry
- You should know the industry standard very well related to your job, safety, and welfare
- Understand the points given clearly and act accordingly
- If you need any clarification to understand, get guidance from the concerned person or from your superior
- Align the industrial standard with organizational standard and work accordingly
- Working as a team, make others also to follow the standards and motivate them to complete the task successfully

Scan the QR code to see the related video



Health and Safety hazards

UNIT 9.5: 5S

Unit Objectives

At the end of this unit, you will be able to :

1. know what is “5S” and 5S techniques.
2. know the detailed explanation of 5S and benefits of 5S.

9.5.1: 5S

- 5 'S' is a Japanese technique of house keeping
- It is a general concept
- It is a systematic and methodical approach allowing teams to organize their workplace in the safest and most efficient manner
- It can be implemented in all Educational Institutions, Factories, Hotels, Hospitals, Offices, Banks and ever where including home

9.5.2: 5'S' TECHNIQUE

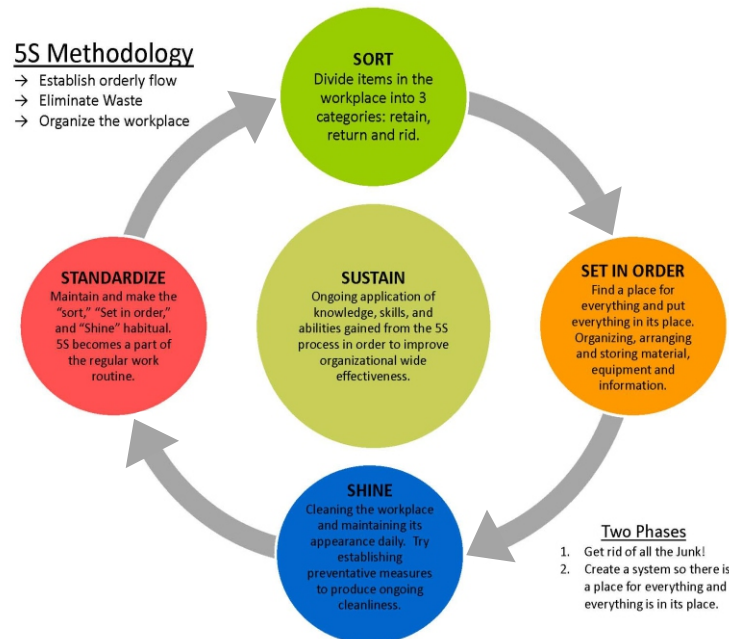


Fig. 9.5.2.1: 5S implementation step by step

- First S-SEIRI – Sort (1S)
- Second S-SEITON – Straighten (2S)
- Third S-SEISO – Shine (3S)
- Fourth S-SEIKETSU – Standardize (4S)
- Fifth S-SHITSUKE – Sustain (5S)

9.5.3: 1S-SEIRI - Sort


- Sort out & separate the material which is needed & not needed in the area
- Distinguishing between necessary and unnecessary things, and getting rid of what you do not need
- Ask superior to tag all items which they don't think are needed - this improves understanding about need and use
- Classify all equipment and materials by frequency of use to help decide if it should be removed- place 'Red Tag' on items to be removed
- Establish a 'holding area' for items that are difficult to classify- hold item for allotted period to enable others not on 5S team to review
- Needed or wanted material alone to keep and all other unwanted materials to be disposed or destroyed. Some materials will be in good condition but not need for us. Such materials to be stored in separate place
- Some model visual photos of Seiri activities

Fig. No. & Location	Before	After
Fig. 9.5.3.1: Service room		
Fig. 9.5.3.2: Tools rack in service room		

9.5.4: 2S-SEITON - Straighten

- It is the practice of orderly storage of materials so the right item can be picked efficiently (without waste), at the right time
- Identify and allocate a place for all the materials needed for your work based on usage Assign fixed places and fixed quantity
- Arrange materials in such a way easy to access by everyone
- Make it compact



- Fix a place for everything and keep in its place after use
- Place heavy objects to be stored in a easy assessable height
- Identify the ally way and storage area with proper colour line
- Decide how things should be put away, and obey those rules
- Arrange items that are frequently needed rarely needed so that they are ready & easy to use
- Keep the frequently needed materials nearer to work place at reachable distance
- Keep the Rarely needed materials in distance clearly identify locations for all items so that anyone can find them & return them once the task is completed
- Some visual photos of before and after of Seiton

Fig. No. & Location	Before	After
Fig. 9.5.4.1: Tools box in service room		
Fig. 9.5.4.2: Rack in service room		

9.5.5: 3S-SEISO - Shine

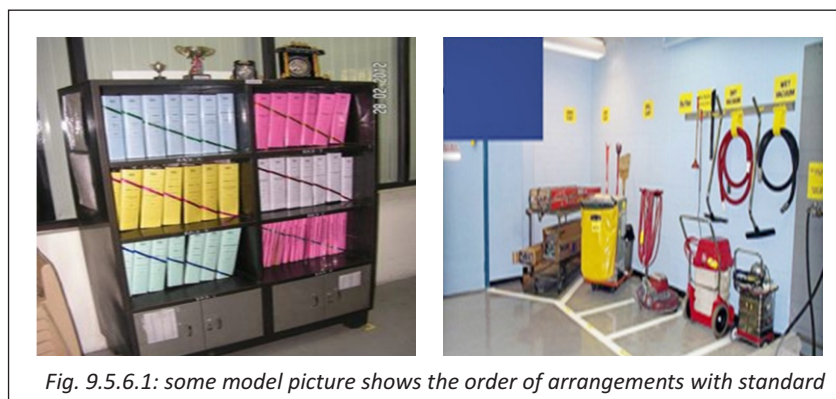
- Create a clean worksite without garbage, dirt and dust, so problems can be more easily identified (leaks, spills, excess, damage, etc)
- Identify the root causes for dirtiness, and correct it
- Keep tools and equipment clean and in top condition, ready for use at anytime
- Cleaning should be a practice of daily activity. At least 5 minutes per day
- Follow the cleaning schedules correctly
- Use chart with signatures/initials if any shows that the action or review has taken place
- Ensure proper lighting to see dirt and dust easily
- Clean the workplace & equipment on a regular basis in order to maintain standards & identify defects.
- Check the condition of the equipments

- If any damage or defected tools or equipments found, replace it with new one
- Avoid dumping unnecessary materials in work spot
- Dispose the waste in time
- Model photo showing the before and after Seiso

Fig. No. & Location	Before	After
Fig 9.5.5.1: Model photo of M/c cleanliness		

9.5.6: 4S-SEIKETSU - Standardize

- Setting up standards for a neat, clean, workplace
- Standardization of best practices through 'visual management'
- Make abnormalities visible to management
- Keep each area consistent with one another
- Standards make it easy to move workers into different areas
- Create process of how to maintain the standard with defined roles and responsibilities
- Make it easy for everyone to identify the state of normal or abnormal conditions - place photos on the walls, to provide visual reminder
- Revisit the first three of the 5S on a frequent basis and confirm the condition of follow up using standard procedures



9.5.7: 5S - SHITSUKE - Sustain

- Implementing behaviors and habits to maintain the established standards over the long term, and making the workplace organization the key to managing the process for success
- Toughest phase is to Sustain-many falls short of this goal
- Establish and maintain responsibilities- requires leader commitment to follow through
- Every one sticks to the rules and makes it a habit
- Participation of everyone in developing good habits and buy-in
- Regular audits and reviews
- Get to root cause of issues
- Aim for higher 5S levels - continuous improvement Keep to the rules to maintain the standard & continue to improve every day

9.5.8: Benefits of 5S

- 5S are particularly effective because they want to improve the housekeeping of your workshops and the rest of your premises in order to obtain the following advantages
- Improve safety
- Improve the working atmosphere and environment
- Improve the quality of work and products
- Enable efficient maintenance
- Enhance your image and customer trust
- Prepare the launch of other methodologies
- Improves material retrieval time
- Savings in space consumption
- Maintain the morality of individual

UNIT 9.6: Kaizen

Unit Objectives

At the end of this unit, you will be able to :

1. know what is “Kaizen”.
2. know the steps of Kaizen and its benefits.

9.6.1: Kaizen

- Kaizen is the practice of continuous improvement
- Kaizen focuses on applying small, daily changes that result in major improvements overtime
- Kaizen methods can be used to improve the results of any firm and can also be used
- Kaizen (continual improvement) creates a culture where employees throughout the organization are actively engaged with improving productivity
- Word "kaizen", where "kai" = change "zen" = good, simply means "change for better"
- Growth is nothing but improvement in activity
- Think that any activities need improvement
- There are two ways of improvement
- Improvement can be achieved by investigating big things for change of situation.
- Improvement can be achieved by doing some small-small changes in current situation with continuous manner also
- The second concept of continual improvement of current process called kaizen. Kaizen tells us don't waste your day without improving wherever possible. This leads the organization people in disciplinary manner and it is bound to work with importance of time, skill and quality

9.6.2: Steps for Kaizen

- **There are four main steps in Kaizen. They are**
 - Step 1 – Identifying the current situation
 - Step 2 – Planning and Preparation
 - Step 3 – Implementation
 - Step 4 – Follow up
- **Step 1: Identifying Current Situation**
 - Understand the existing processes and dependencies.
 - Identify all the activities currently involved in developing a new product. Observe the process first
 - Identify Value Added (VA) and Non-Value Added (NVA).
 - Generally creates more questions than answers
- **Step 2: Planning and Preparation**
 - Identify the correct area in the organization that requires the immediate implementation of rapid improvement event

- After identifying the most appropriate production, administrative or a specific segment in the workplace, the focus should be given in particular to "waste elimination" issue prevailing in that department for implementing the kaizen event.
- After identifying the problematic area, the managers have to build a team of employees
- Prior to the training, the entire team should be completely aware of the organization's rapid improvement process and given appropriate training on the process
- The duration of kaizen events varies depending on the length of the process involved and depth of the problem
- **Step 3: Implementation**
 - The first and foremost work of the team is to identify and clearly understand the "current state" of the targeted process
 - This would give the team members a common and a clear picture of problem that they are aiming to solve
 - Why-Why analyze to understand the root cause of a problem step by step
 - The team members would raise queries on the aim of the process, and clearly observe the wastes, reasons for waste and analyze it
 - The most appealing and fruitful ideas are selected and suggested for implementation
- **Step 4: Follow up**
 - This is the very important phase in the kaizen event as this ensures that the improvements are consistent and not just for time being
 - On completion of kaizen event, the team members should keep track of performance as a routine in terms of metrics measures to record the gains
 - In general, the follow up kaizen events are conducted in 30 to 90 days after the first kaizen event in aim of assessing the performance and locate the follow-up changes that should undertaken to maintain the consistency in performance and development



Fig. 9.6.2.1: Kaizen Before – Used for single department – Front of the wall



Fig. 9.6.2.2: Kaizen After- Used for both departments. Front and Back of the wall

UNIT 9.7: Non-Conformities

Unit Objectives

At the end of this unit, you will be able to :

1. know what is Non-conformity.
2. know the types of non-conformity and its disposal methods.

9.7.1: Non-Conformities

- Failure to conform to accepted standards, conventions, rules, or laws is non-conformities
- Non-conformity comes in Product, Procedure and Document
- In quality management a non-conformity (also known as a defect) is a deviation from a specification, a standard, or an expectation. Nonconformities are classified as critical or major or minor
- Anything which does not meet customer requirement is also called non-conformity

9.7.2: Non- Conformity in Product

- Any product which does not meet the requirement in Quality, Quantity, Shape and Size is known as product non-conformity
- Failure in timely delivery to the subsequent process is also nonconformity
- Sliver material with the irregularity not meeting the requirement of subsequent process is a non-conforming product
- Sliver material with dirt and stain is a non-conforming product

9.7.3: Non-Conformity in Procedure

- Deviation of activities to the procedure is known as procedure of non-conformity
- Not following the cleaning schedule is procedure of non-conformity
- If a work is done without complying with the standard work instruction, it is a procedure of non-conformity
- If roller settings, draft and critical items differing from standard, it is a procedure of non conformity
- If a document is changed without proper approval from concern authority mean it is a procedure non-conformity

9.7.4: Non-Conformity in Document

- If documents are not updated means it is document non-conformity
- Job card not filled or partly filed job card are document non-conformity
- If the working procedure is not updated according to the process is called procedure non conformity
- If the roller settings, draft, critical items are not updated in the standard operating procedure mean, it is a documentation non-conformity

9.7.5: Disposal of Non-Conformity

- Disposal of non-conformity is two procedures
 - Disposal of non-conformity
 - Disposal of non-conforming product
- Disposal of non-conformity is a temporary correction of the problem example replacing the worn-out wheel, belt etc.,
- Disposal of non-conforming product is identified faulty material correction / disposal as per standard procedure
- Extra care to take while disposing the non-conforming product to avoid wrong faulty product get delivered to the customer
- Procedure for disposal method to be clearly defined
- For any disposal get concerns from the superior
- Disposal record should be signed by the superior then and there
- Ensure the corrective action followed by disposition and conform the effectiveness of disposition / corrective action immediately

UNIT 9.8: Do's and Don'ts

Unit Objectives

At the end of this unit, you will be able to :

1. know about the Do's and Don'ts in the department.

9.8.1: Do's and Don'ts

S. No.	Dos	Don'ts
1.	Work with self interest	Work without interest
2.	Set Career goal, plan and execute	Be comfort in the existing and no efforts for self development
3.	Work as a team	Working independently
4.	Discuss about the problem	Argue about the persons
5.	Listen others voice in team	Neglecting members voice
6.	Follow 5S procedure meticulously	Think it is a burden
7.	Doing small small Kaizens	Doing routine and no efforts for improvement / development
8.	Dispose the non-conformity as per the procedure	Disposing the non-conformity as like wish
9.	Understand the rules and regulation of the organization	Working without understanding the rules and regulation
10.	Contamination polluted water to be treated in effluent	Discharging the contaminated polluted water to open land/ plantation
11.	Proper PPE to wear when handling chemicals to avoid occupational decease	Neglecting the PPE

Table 9.8.1.1: Do's and Don'ts

Tips

- Learn from everything and try then and there for self-development
- Fix a career target, plan for it with time line and work towards it for career development
- Always work as a team and be a good team player
- Listen to alternate ideas and be a first one to good changes
- Learn about organizational standards and follow meticulously. Discuss the standards what you have known with superiors and understand clearly
- Be a best follower of any system and take leadership when it is offered through, 5s zone head, Quality circle head etc.,
- Pursue the standards daily which makes some positive inspiration to others to follow you
- Know about the industry standard and follow strictly

Self-Assessment

- Brief about Career development
- What are the qualities required for team members?
- What are the benefits in Team work?
- Mention some of the organizational standards
- Brief about 5S
- Brief about Kaizen
- How to handle nonconformity?
- What precaution to take to prevent occupational decease in the unit.

Notes



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N.S.D.C.
RE IMAGINE FUTURE

10. Annexure



QR Codes - Video Links

Module No.	Unit No. and Title	Page No.	QR Code Link	QR Code
1. Introduction	Unit 1.1 Introduction and History of weaving	3	www.youtube.com/watch?v=3PDlybCdcqY	 Technical Textiles: A Sunrise Segment in the Textile Ecosystem
2. Taking charge and handing over the shift to Circular loom operator (Shuttle type)	Unit 2.1 Taking Charge & Handing over the shift to Circular loom operator	15	www.youtube.com/watch?v=gXzxM51etl0	 Loom Operator Duty
3. Running Circular Loom Shuttle type	Unit 3.3 Instructions for Circular Loom Operator	29	www.youtube.com/watch?v=J6nfOqfK6aA	 Circular Loom - Nova 6HS
4. Undertake warp threading in circular loom (Shuttle type)	Unit 4.1 Threading Methodology of Loom	39	www.youtube.com/watch?v=oiniQyk2cHg	 Circular Loom - Nova 6
5. Contribute quality weaving in Circular loom (Shuttle type)	Unit 5.2 Weaving Faults, Causes & Remedies	46	www.youtube.com/watch?v=jcT8fgW5uGc	 Circular Loom Maintenance
	Unit 5.3 General Maintenance of Loom	48	www.youtube.com/watch?v=IJtGn4Ap9LE	 Shuttle Maintenance
	Unit 5.4 Weaving Designs	51	www.youtube.com/watch?v=1hGwJFBWn-k	 Circular Loom - Nova 6

Module No.	Unit No. and Title	Page No.	QR Code Link	QR Code
6. Maintain work area, tools and machines in raffia sector	Unit 6.3 Instructions for Loom Operator	61	www.youtube.com/watch?v=5_IFz7FEZ9E	 <p>Safety Attitudes</p>
7. Working in a team in raffia sector	Unit 7.2 Being a successful team player	70	www.youtube.com/watch?v=OPs4MQOIZAQ	 <p>Industrial Safety</p>
8. Maintain health, safety and security at work place in raffia sector	Unit 8.6 Unsafe Conditions at Workplace	88	www.youtube.com/watch?v=9S_j3uTfaTw	 <p>Implementing Health & Safety in Workplace</p>
9. Comply with industry and organizational requirements in raffia sector	Unit 9.4 Industrial Standards	107	www.youtube.com/watch?v=5ubPG7_Tq8Q	 <p>Health and Safety hazards</p>





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Textile Sector Skill Council (TSC)

Address : Unit 1011-1013, 10th Floor, Ambadeep Building
14 Kasturba Gandhi Marg, New Delhi - 110 001

Email : info@texskill.in

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